



## WAR MEMORIAL FIELD IMPROVEMENTS PHASE I

### ADDENDUM NO. 1

DATE: March 3, 2020

**REVISED BID OPENING: Thursday, March 12 @ 2:00:00 P.M.**

PAGES: Addendum (2 pages)  
Bid Form (10 pages)  
Special Provisions (130 pages)  
Drawings (11 sheets)

.....

Acknowledge receipt of this Addendum by inserting its number and date on the Bid Form. Failure to do so may subject bidder to disqualification. This Addendum forms a part of the Contract Documents. It modifies the Contract Documents as follows:

-----

### **PART 2, INSTRUCTIONS TO BIDDERS**

#### **ARTICLE 17 – EVALUATION OF BIDS AND AWARD OF CONTRACT**

*Replace the first sentence of Article 17.06 with the following:*

17.06 Bids Due, Bid Opening – March 12, 2020.

-----

### **PART 3, BID FORM**

*Replace Bid Form in its entirety.*

-----

**PART 6, SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT  
(EJCDC-C-700)**

6.05 *Property Losses: Subrogation*

*Add the following:*

SC-6.05 Delete Article 6.05 in its entirety.

---

**PART 7, SPECIAL PROVISIONS**

*Delete the Special Provisions Pages 22 – 153 in their entirety and replace with revised Special Provisions Pages 22-151 (attached).*

---

**PART 9, CONTRACT DRAWINGS**

*Replace Drawings C3.1, L0.0, L0.1, L6.3, E1.0, E1.2, E8.1, E8.2, E8.3, E8.4, and S4.1 with revised versions (attached).*

*Revise sheet scale note on Sheets D1.1, C1.1, C1.2, C1.3, C3.1 as follows:*

SCALE: ~~1"=30'-0"~~ 1"=30'-0" @ 22"X34" (FULL SIZE), 1"=60'-0" @ 11"X17" (HALF SIZE)

*Add sheet note to Sheet C1.3 as follows:*

1. CTB LIMITS ADJACENT TO FUTURE VICTORY BELL SHALL BE DETERMINED BY THE OWNER DURING CONSTRUCTION.

**END OF ADDENDUM NO. 1**

**BID FORM**  
**City of Sandpoint**  
**War Memorial Field Improvements, Phase I**

**ARTICLE 1 – BID RECIPIENT**

1.01 This Bid is submitted to:

City of Sandpoint  
1123 Lake Street  
Sandpoint, ID 83864

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

**ARTICLE 2 – BIDDER’S ACKNOWLEDGEMENTS**

2.01 Bidder accepts all of the terms and conditions of the Advertisement, Instructions to Bidders, and Bidding Documents, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

**ARTICLE 3 – BIDDER’S REPRESENTATIONS**

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

Addendum No.

Addendum Date

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Bidder is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in SC-5.03 as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in SC-5.06 as containing reliable "technical data."
- E. Bidder has considered the information known to Bidder; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance

- of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs.
- F. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, test, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents to be employed by Bidder safety precautions and programs incident thereto.
  - G. Based on the information and observations referred to in Paragraph 3.01.E above, Bidder does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
  - H. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
  - I. Bidder has given Owner written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Owner is acceptable to Bidder.
  - J. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

#### **ARTICLE 4 – BIDDER'S CERTIFICATION**

##### **4.01 Bidder certifies that:**

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
  - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process;
  - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;



3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

## ARTICLE 5 – BASIS OF BID

Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price
2010.4.1.A.1.	Mobilization	LS	1	<b>LUMP SUM</b>	\$ _____
1103.4.1.A.1	Traffic Control	LS	1	<b>LUMP SUM</b>	\$ _____
1001.4.1.A.1	Construction Site Management	LS	1	<b>LUMP SUM</b>	\$ _____
201.4.1.C.1	Removal of Obstructions	LS	1	<b>LUMP SUM</b>	\$ _____
201.4.1.E.1	Remove Existing Chain-link Fencing	LF	150	\$ _____	\$ _____
201.4.1.D.1	Removal of Existing Asphalt	SY	180	\$ _____	\$ _____
201.4.1.A.1	Clearing and Grubbing – (8-Inch) Depth	CY	3,850	\$ _____	\$ _____
202.4.1.E.1	Excavation & Haul Offsite	CY	7,000	\$ _____	\$ _____
202.4.1.F.1	Unsuitable Material Excavation & Haul Offsite	CY	1,000	\$ _____	\$ _____
202.4.1.G.1	Field Rough Grading / CTB Prep	SY	16,500	\$ _____	\$ _____
202.4.6.A.1	Borrow	CY	1,200	\$ _____	\$ _____
706.4.1.E.1	Concrete Sidewalks, Thickness 4-inches	SY	15	\$ _____	\$ _____

706.4.1.A.1	6-Inch Vertical Curb (No Gutter)	LF	20	\$ _____	\$ _____
801.4.1.A.1	1-inch Minus Uncrushed Aggregate Base	CY	1,200	\$ _____	\$ _____
303.4.1.A.1	Exploratory Excavation (Non-Groundwater)	HR	16	\$ _____	\$ _____
401.4.1.C.1	Water Service Line (2-inch) HDPE	LF	850	\$ _____	\$ _____
601.4.1.A.1	(18-Inch) Storm Drain, PS46 ASTM F679	LF	245	\$ _____	\$ _____
602.4.1.A.1	Storm Drain Manhole	EA	1	\$ _____	\$ _____
704.4.1.F.1	Precast Concrete Stormwater Outfall	EA	1	\$ _____	\$ _____
810.4.1.A.3a	Plant Mix Pavement, 2-Inch Thickness (Includes Base)	SY	330	\$ _____	\$ _____
810.4.1.A.3b	Plant Mix Pavement, 4-Inch Thickness (Includes Base)	SY	30	\$ _____	\$ _____
1006.4.1.B.1	Riprap Slope & Outlet Protection	SY	25	\$ _____	\$ _____
SP2.4.1.A.1	Portland Cement for Cement Treated Base	TON	610	\$ _____	\$ _____
SP2.4.1.B.1	Cement Treated Base (CTB)	SY	16,500	\$ _____	\$ _____
SP3.4.1.A.1	Synthetic Turf – Base Course	CY	6,160	\$ _____	\$ _____
SP3.4.1.B.1	Synthetic Turf – Top Course	CY	1,230	\$ _____	\$ _____
SP3.4.1.C.1	Field Drain Pipe – (12-Inch) Perforated Flat Drain	LF	9,810	\$ _____	\$ _____
SP3.4.1.D.1	Field Drain Pipe – (12-Inch) Perforated Pipe	LF	315	\$ _____	\$ _____
SP3.4.1.E.1	Field Drain Pipe – (18-Inch) Perforated Pipe	LF	395	\$ _____	\$ _____

SP3.4.1.F.1	Field Drain Basin	EA	1	\$ _____	\$ _____
705.4.1.A.1	Concrete Flatwork Pavement, (4-inch) Thickness	SF	160	\$ _____	\$ _____
703.4.1.D	Install Concrete Footing for Future Phase II Dugout Construction	EA	4	\$ _____	\$ _____
703.4.1.E.1	Install Turf Edge - Type I	LF	30	\$ _____	\$ _____
703.4.1.F.1	Install Turf Edge – Type II	LF	585	\$ _____	\$ _____
703.4.1.G.1	Install Turf Edge – Type III	LF	200	\$ _____	\$ _____
703.4.1.H.1	Install Turf Edge – Type V	LF	60	\$ _____	\$ _____
703.4.1.I.1	Install Turf Edge – Type VI	LF	165	\$ _____	\$ _____
703.4.1.J.1	Install Turf Edge – Type VII	LF	65	\$ _____	\$ _____
SP7.4.1.A.1	Install Festival Tent Anchors w/ Helical Piers	EA	6	\$ _____	\$ _____
704.4.1.E	Construct Precast Festival Tent Concrete Ballast Weights	EA	22	\$ _____	\$ _____
SP8.4.1.A	Install (2-Inch) Irrigation System Point-of-Connection (P.O.C.)	LS	1	\$ _____	\$ _____
SP8.4.2.A	Install (2-Inch) Irrigation Mainline	LF	1,560	\$ _____	\$ _____
SP8.4.3.A	Install (6-Inch) PVC Irrigation Sleeve	LF	20	\$ _____	\$ _____
SP8.4.4.A	Install Quick Coupler w/ Turf Box	EA	10	\$ _____	\$ _____
SP8.4.5.A	Install Isolation Valve w/ Turf Box	EA	5	\$ _____	\$ _____
SP8.4.6.A	Re-Connect Existing Irrigation Circuit Piping	LS	1	\$ _____	\$ _____

SP4.4.1.A.1	Install Synthetic Turf System	SF	144,200	\$ _____	\$ _____
SP6.4.1.A	6ft Ht. Galvanized Chain-link Fence	LF	8	\$ _____	\$ _____
SP6.4.2.A	8ft Ht. Galvanized Chain-link Fence	LF	320	\$ _____	\$ _____
SP6.4.3.A	12ft Ht. Galvanized Chain-link Fence	LF	149	\$ _____	\$ _____
SP6.4.4.A	6ft Ht. x 16ft Wide Double Swing Chain-link Gate	EA	1	\$ _____	\$ _____
SP6.4.5.A	8ft Ht. x 4ft Wide Single Swing Chain-link Gate	EA	3	\$ _____	\$ _____
SP6.4.6.A	8ft Ht. x 14ft Wide Double Swing Chain-link Gate	EA	1	\$ _____	\$ _____
SP6.4.7.A	8ft Ht. x 8ft Wide Double Swing Chain-link Gate	EA	2	\$ _____	\$ _____
SP6.4.8.A	12ft Ht. x 14ft Wide Double Swing Chain-link Gate	EA	1	\$ _____	\$ _____
SP6.4.9.A	12ft Ht. x 4ft Wide Single Swing Chain-link Gate	EA	1	\$ _____	\$ _____
SP6.4.10.A	12ft Ht. x 8ft Wide Single Swing Chain-link Gate	EA	1	\$ _____	\$ _____
SP9.4.1.A	Electrical Utility Relocation, Conduits, Trenching, & Fees	LS	1	<b>LUMP SUM</b>	\$ _____
SP14.4.1.A	Relocate and Install Existing Field Light Poles to New Locations	EA	2	\$ _____	\$ _____
SP14.4.1.B	Upgrade Existing Field Lights to L.E.D. Fixtures	EA	6	\$ _____	\$ _____
SP14.4.1.C	New Field Light Pole w/ L.E.D. Fixtures	EA	1	\$ _____	\$ _____
SP10.4.1.A	Field Lighting Ground Installation	LS	1	<b>LUMP SUM</b>	\$ _____
SP11.4.1.A	Baseball Field Improvements	LS	1	<b>LUMP SUM</b>	\$ _____

SP12.4.1.A	Phase II Electrical Preparation	LS	1	<b>LUMP SUM</b>	\$ _____
SP13.4.1.A	Cable for Osprey Camera (Cat6 Cable, Trenching, Conduit, Data Rack)	LS	1	<b>LUMP SUM</b>	\$ _____
SP27.4.1.A	Football Field Goals	EA	2	\$ _____	\$ _____
SP6.4.11.A	Football Safety Netting Posts (30ft. Above Grade)	EA	2	\$ _____	\$ _____
SP6.4.16.A	Football Safety Netting	SF	1,280	\$ _____	\$ _____
703.4.1.B	Baseball Backstop Concrete Wall	LF	128	\$ _____	\$ _____
703.4.1.C	Softball Backstop Concrete Wall	LF	118	\$ _____	\$ _____
SP6.4.12.A	Baseball Backstop Netting Posts (40ft. Above Grade)	EA	4	\$ _____	\$ _____
SP6.4.13.A	Softball Backstop Netting Posts (30ft. Above Grade)	EA	4	\$ _____	\$ _____
SP27.4.8.A	Baseball Foul Pole w/ Turf Access Box	EA	1	\$ _____	\$ _____
SP27.4.9.A	Baseball Foul Pole w/ Concrete Access Box	EA	1	\$ _____	\$ _____
SP27.4.2.A	Baseball Base Set	EA	1	\$ _____	\$ _____
SP27.4.3.A	Baseball Home Plate	EA	1	\$ _____	\$ _____
SP27.4.4.A	Softball Base Set	EA	1	\$ _____	\$ _____
SP27.4.5.A	Softball Home Plate	EA	1	\$ _____	\$ _____
SP27.4.6.A	Softball Pitching Rubber	EA	1	\$ _____	\$ _____
2060.4.1.A.1.	Minor Changes	CS	1	<b>CONTINGENT SUM</b>	\$ 25,000.00

SP6.4.14.A	Baseball Backstop Netting	SF	4,864	\$ _____	\$ _____
SP6.4.15.A	Softball Backstop Netting	SF	3,304	\$ _____	\$ _____
SP27.4.7.A	Baseball Foul Pole w/ Turf Access Box	EA	1	\$ _____	\$ _____
SP27.4.8.A	Baseball Foul Pole Outside Turf Mount	EA	1	\$ _____	\$ _____
SP27.4.9.A	Helical Pier Access Box	EA	6	\$ _____	\$ _____
<b>TOTAL OF BID SCHEDULE A</b>				\$ _____	

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price
SP5	Schedule B - Alternate #1 Synthetic Turf System	SF	144,200	\$ _____	\$ _____
<b>TOTAL OF BID SCHEDULE B</b>					

5.01 Bid prices listed shall include all applicable taxes and fees.

5.02 Unit Prices have been computed in accordance with the Contract Documents.

5.03 Bidder acknowledges that estimated quantities are not guaranteed and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

#### ARTICLE 6 – TIME OF COMPLETION & EMPLOYMENT

6.01 Bidder agrees that all items included in the Base Bid and Alternate, if awarded, will be substantially complete by July 21, 2020 and will be completed and ready for final payment in accordance with the General Conditions by July 30, 2020.

6.02 Bidder accepts the provisions of the Contract Documents as to liquidated damages.

6.03 Bidder agrees to comply with Idaho Code 44-1001 through 44-1005, regarding employment of Idaho residents.

#### ARTICLE 7 – ATTACHMENTS TO THIS BID

7.01 The following documents are submitted with and made a condition of this Bid:

- A. Required Bid security in the form of: cash, a certified check, cashier's check, or a Bid bond (on the form attached) issued by a surety meeting the requirements of the General Conditions.;
- B. Bidder shall include in his Bid the name, or names and address, or addresses, and Idaho Public Works Contractor License Numbers of the Subcontractors who shall, in the event the Bidder secures the Contract, subcontract the plumbing, heating and air-conditioning work, and electrical work under the general Contract;
- C. State of Idaho Public Works Contractor's License No.: \_\_\_\_\_ ;
- D. *Not Used*

## ARTICLE 8 – DEFINED TERMS

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Bidding Documents.

## ARTICLE 9 – BID SUBMITTAL

9.01 This Bid is submitted by:

If Bidder is:

### An Individual

Name (typed or printed): \_\_\_\_\_

By: \_\_\_\_\_  
(Individual's signature)

Doing business as: \_\_\_\_\_

### A Partnership

Partnership Name: \_\_\_\_\_

By: \_\_\_\_\_  
(Signature of general partner -- attach evidence of authority to sign)

Name (typed or printed): \_\_\_\_\_

### A Corporation

Corporation Name: \_\_\_\_\_ (SEAL)

State of Incorporation: \_\_\_\_\_  
Type (General Business, Professional, Service, Limited Liability): \_\_\_\_\_

By: \_\_\_\_\_  
(Signature -- attach evidence of authority to sign)

Name (typed or printed): \_\_\_\_\_

Title: \_\_\_\_\_  
(CORPORATE SEAL)

Attest \_\_\_\_\_

Date of Qualification to do business in Idaho is \_\_\_\_/\_\_\_\_/\_\_\_\_.

**A Joint Venture**

Name of Joint Venture: \_\_\_\_\_

First Joint Venturer Name: \_\_\_\_\_ (SEAL)

By: \_\_\_\_\_  
(Signature of first joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): \_\_\_\_\_

Title: \_\_\_\_\_

Second Joint Venturer Name: \_\_\_\_\_ (SEAL)

By: \_\_\_\_\_  
(Signature of second joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): \_\_\_\_\_

Title: \_\_\_\_\_

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

Bidder's Business Address \_\_\_\_\_

\_\_\_\_\_

Phone No. \_\_\_\_\_ Fax No. \_\_\_\_\_

E-mail \_\_\_\_\_

SUBMITTED on \_\_\_\_\_, 20\_\_\_\_.

Idaho Public Works Contractor License No. \_\_\_\_\_.



# Contract Documents for War Memorial Field Improvements Phase I

Prepared for: City of Sandpoint, Idaho

	 <p>SANDPOINT</p> <p>Prepared by City of Sandpoint: Part 7 Sections 2010, 2060</p>
	 <p>Prepared by Bernardo Wills Architects: Part 7 Sections 703, SP4, SP5, SP6, SP8, SP22</p>
	 <p>Prepared by Welch Comer Engineers &amp; Surveyors: Part 7 Sections 201, 202, 306, 404, 803, 805, 810, 1003, 1103, 1105, SP1, SP2, SP3, SP23</p>
	 <p>Prepared by Coffman Engineers:</p> <p>Part 7 Sections SP9, SP10, SP11, SP12, SP13, SP14, SP15, SP16, SP17, SP18, SP19, SP20, SP21</p>
	 <p>Prepared by Eclipse Engineering:</p> <p>Part 7 Sections 702, 703, 704, SP7</p>

## **SP 2 – CEMENT TREATED BASE**

### **PART 1 - GENERAL**

#### **1.1 SECTION INCLUDES**

- A. The work consists of constructing a cement treated base.

#### **1.2 RELATED SECTIONS**

- A. SP3 Synthetic Turf Base Courses and Drainage System – 2 Lift System

#### **1.3 REFERENCES**

- A. 2017 Idaho Standards for Public Works Construction

### **PART 2 - MATERIALS**

#### **2.1 MATERIALS SHALL MEET THE FOLLOWING REQUIREMENTS OF THE FOLLOWING SECTIONS:**

- A. AASHTO M85, Type II Portland Cement

### **PART 3 - WORKMANSHIP**

#### **3.1 CONSTRUCTION METHODS AND EQUIPMENT**

- A. The Contractor shall submit a detailed description of the construction methods and a list of equipment that will be used in the cement treatment process for review and comment by the Engineer.
- B. No work shall begin on the cement treated base until a meeting has been conducted between the Contractor and the Engineer to review the construction methods and equipment.

#### **3.2 PREPARATION OF AREA FOR CEMENT TREATED BASE**

- A. The subgrade shall then be brought to uniform grade and cross section in accordance with ISPWC Section 202. No work shall begin on the cement treated base until the Engineer has accepted the subgrade construction.
- B. Only approved equipment will be permitted on the on the subgrade and perform the placement and blending of the materials.
- C. A test section shall be constructed at the start of the Cement Treated Base operation and using the equipment that the Contractor will use in the Cement Treated Base operation.
- D. Production work on the Cement Treated Base shall not begin until successful completion of the test section, as determined by the Engineer.

#### **3.3 INCORPORATION OF CEMENT AND WATER**

- A. Air temperature shall be 45 degrees or higher to proceed with cement treatment process. Cement shall not be mixed with frozen

soil or when freezing temperatures are anticipated during the curing process.

- B. Cement shall be applied uniformly at a rate of 5% of the dry weight of the material to be treated.
- C. The equipment and method used shall ensure the uniformity of cement distribution within the full depth to be treated and that the actual weight of cement applied does not vary more than 5% from the specified rate.
- D. Any equipment or method, which results in excessive loss or displacement of cement, the use of the equipment or method shall be immediately discontinued.
- E. Cement which is lost or displaced by blowing, washing, or other causes before it is mixed or incorporated in the material to be stabilized shall be replaced by the Contractor at no cost to the Owner.
- F. No equipment except that of watering and for applying and mixing the cement shall be permitted to pass over spread cement until after it is mixed into the materials to be stabilized.
- G. Apply water evenly, if necessary, until optimum moisture content is achieved.
- H. The rate at which cement shall be applied may be adjusted by the Engineer prior to placement depending on actual field conditions.

#### 3.4 MIXING

- A. The initial mixing of the cement, water and materials to be stabilized shall be started within two hours after the application of cement. Mixing shall continue until a homogenous mixture is obtained.

#### 3.5 COMPACTION AND FINISHING

- A. Immediately after the mixing has been completed, the mixture shall be spread to specified line, grade and cross section and the entire depth of the mixture shall be compacted to the grade and smoothness as shown in the Plans.
- B. Final compaction shall be accomplished with a minimum of 10 passes of a pneumatic tire roller. Rolling shall continue until there is no appreciable reaction or yielding under the roller.
- C. This compaction shall be obtained, and the surface brought to finished condition within 2 hours after water is applied. No section shall be left unworked for longer than 30 minutes during compaction. During the compacting, the surface of the mixture shall be maintained at proper grade and cross-section. Maintain moisture content within 1.5% of optimum.
- D. Final finishing shall be accomplished by rolling, accompanied by light watering and reshaping to provide a finished surface free of hairline cracking and free of ridges.

### 3.6 SURFACE TOLERANCE

- A. The finished surface of the cement treated base shall not vary by more than 0.04 foot from established grade and cross section at any point when tested with a 10-foot straightedge. The Contractor shall furnish the straightedge and operate it under the direction of the Engineer.

### 3.7 CURING AND PROTECTION

- A. Immediately after the compaction and finishing of the cement treated base has been completed and while it is still moist, Contractor shall begin hydrating the surface through Contractor provided irrigation sprinklers.

## **PART 4 - MEASUREMENT AND PAYMENT**

- 4.1 Use one of the following unit price options as designated on the Bid Schedule. If required and not listed in the Bid Schedule, the following Bid Items are to be considered incidental to other bid items:

- A. Portland Cement: By the ton.
  - 1. Bid Schedule Payment Reference: SP2.4.1.A.1
  - 2. Bid Schedule Description: Portland Cement for Cement Treated Base ...ton (TON).
- B. Cement Treated Base: By the square yard.
  - 1. Bid Schedule Payment Reference: SP2.4.1.B.1
  - 2. Bid Schedule Description: Cement Treated Base ...square yard (SY).

## **SP-3 SYNTHETIC TURF BASE COURSES AND DRAINAGE SYSTEM**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Work Included: Crushed Aggregate Base Courses and Drainage System
- B. Related work specified elsewhere:
  - 1. Excavation / Earthwork
  - 2. Cement Treated Base
  - 3. Concrete
  - 4. Irrigation
  - 5. Synthetic Turf System

#### **1.2 DESCRIPTION OF WORK**

- A. Provide and install the base courses, including top course and base course, for the synthetic turf and related appurtenances, including but not limited to drainage piping system and grade preparation ready to receive the synthetic turf.
- B. Changes and Substitutions
- C. The contractor shall strictly adhere to the procedures outlined under this Section. Any variance from these requirements will only be accepted by the Owner upon acceptance in writing by the synthetic turf contractor onsite representative, verifying that the changes do not in any way affect the synthetic turf warranty. Synthetic Turf Base Planarity, Permeability and Compaction Requirements:
  - 1. Completed Work of this section shall comply with the following:
    - a. Compaction of sub-grade: per SP2 – Cement Treated Base.
    - b. Permeability of 60 inches per hour.
    - c. Planarity of sub-grade: tolerance of one quarter inch (1/4") in ten feet (10').
    - d. Compaction of crushed aggregate base courses: shall be compacted to a minimum of 92%, and no more than 95%, Modified Proctor density.
    - e. Surface tolerance of crushed aggregate top course: not to exceed 1/4 inch over 10 feet and a maximum of 1/2" from design grade.
- D. Testing Requirements:
  - 1. Tests shall include compaction testing of each lift of base courses, measured at a minimum of 18 locations randomly spaced across the surface.
  - 2. The base courses material shall be tested to verify that material meets the specified gradation & permeability requirements.
  - 3. Prior to placing base courses, Contractor shall construct a minimum 10 ft by 10 ft test section over the CTB using the same materials, means and methods planned for the project and test compaction and permeability as outlined in this specification.
    - a. If the testing demonstrates compliance with this specification, the Contractor may proceed with the full placement using the same materials, means and methods.

- b. If the testing fails to meet this specification, the Contractor shall modify its materials, means or methods as necessary in order to satisfactorily meet these specifications.
    - c. The test section shall be constructed and tested not less than five (5) working days prior to the planned day for the entire rock placement.
  - 4. Testing for the entire base course section shall be provided for every 10,000 SF of Synthetic Turf surface, as follows:
    - a. Installed drainage properties to comply with the following:
      - 1) Testing Methods:
        - a) For lab samples, ASTM D 2434-68(2006) "Standard Test Method for Permeability of Granular Soils (Constant Head)
        - b) For field tests:
          - 1. ASTM F 2898, "Standard Test Method for Permeability of Synthetic Turf Sports Field Base Stone and Surface System by Non-confined Area Flood test Method." – Test results shall exceed 60 inches per hour.
        - c) Final approval of infiltration requirements are to be through field testing only.
        - d) Methods not specifically listed above shall be submitted for approval.
  - 5. Test compaction of base courses materials in place according to ASTM D1557, ASTM D 6938, as applicable.
- E. Test results verifying compliance with compaction and permeability requirements shall be supplied to the Owner prior to the commencement of synthetic turf installation.
- F. Contractor to provide surface planarity verification of the top course using a string line method in presence of synthetic turf contractor and owner.
  - 1. A mason's line held taught between two workmen separated by a distance of approximately 40 feet, shall be placed directly on the finished surface, parallel to the direction of greatest slope. A third workman shall check for separations between the mason's line and the finished surface that are equal to or greater than the tolerances specified.
  - 2. Final crushed aggregate permeable base elevations shall conform to the lines and grades shown on the drawings. The measured grades shall not deviate more than (1/2") from the planned grades and not vary more than (1/4") feet in 10 feet in any direction. Laser grading of the finish surface is mandatory.
  - 3. Roller marks, tire tracks, footprints or other impressions on the finished surface shall be raked out where they are equal to or greater than the tolerances specified. Following long and short axis checking and corrections, the Contractor shall notify the Owner, that the finished surface is ready for inspection
  - 4. The Contractor shall perform a final string line check along the long axis of the field in the presence of the Synthetic Turf Surfacing Installer and Owner. Finished surface planarity shall be approved by the Owner and Synthetic Turf installation contractor in writing.
    - a. Please be advised that the visual string line examination and acceptance of the base should not be used as a substitute for independent testing and analysis by a qualified professional engineer. As with all bases, there exists the possibility of hidden, latent or other defects that can only be reliably discovered through inspection, survey or testing by qualified experts in the fields of geology and soils engineering.

5. Damage to the finished surface planarity occurring after approval shall be corrected by the Contractor using the method described above.

### 1.3 SUBMITTALS

- A. Product Data: Submittals required:
  1. Permeable aggregate base material (25 lb sample) including sieve size analysis & source.
  2. Subgrade/Trench Separation Barrier
  3. HDPE pipe & fittings
  4. 1" x 12" Panel Drains

## PART 2 - PRODUCTS

### 2.1 PERIMETER DRAINAGE TRENCH SEPARATION BARRIER

- A. The drainage trench soil subsurface is to be isolated from the installed field and drainage system above it with a geotextile/geomembrane placed across the entire surface of the field. This insures no mixing of the soil sub surface with the aggregate drainage system.
  1. Separation fabric shall be laid and overlapped in accordance with the manufacturer's and project geotechnical engineer's written recommendations.
- B. Subgrade/Trench Separation Barrier:
  1. For permeable subgrade applications: Subgrade/Trench separation barrier shall be a 4oz. Non-Woven Geotextile – Mirafi 140N or approved equal
  2. For Silty/Clayey subgrade applications where the fines content <35% and the Plasticity Index (PI) is < 20 – 4oz. Woven Geotextile – Mirafi 500X or approved equal
  3. For plastic and moisture sensitive soils – 20 mil Woven Coated Polyethylene Geomembrane as manufactured by Brawler Industries, LLC.
  4. Geotechnical Engineer of Record shall approve separation barrier selection based on actual site conditions.

### 2.2 NOTE: See project geotechnical report for specific separation barrier requirements. PERFORATED FLAT DRAIN AND HDPE PERIMETER PIPING

- A. All specific pipes are noted on the Contract Drawings
- B. 4" through 10" solid wall and perforated drainpipe shall be smooth interior wall conforming to AASHTO M252.
- C. 12" through 36" solid wall and perforated drainpipe shall be smooth interior wall conforming to AASHTO M294 Type S.
- D. Fittings and couplers shall be split couplings or snap couplings manufactured by the same manufacturer as the corrugated polyethylene pipe.
- E. Panel Drains shall be a 3-dimensional rigid HDPE (1" x 12" flat panel pipe), AdvanEdge, MultiFlow, or approved equal.

### 2.3 FIELD DRAIN BASIN

- A. Basin shall be 24" Nyloplast Drain Basin, or an approved equal. Basin shall have solid lid and be buried to the top of the CTB depth.

### 2.4 CRUSHED AGGREGATE PERMEABLE BASE COURSES

- A. Material to be clean with minimal fines as described in gradation table below.

- B. Material to be minimum 100% fractured with at least one mechanical fracture per particle greater than 1/4" sieve size. Rounded River Rock is not acceptable.
- C. Base Course: Comply with the below criteria for ASTM #57 Stone, and the following gradation:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
1 1/2" (37.5mm)	100
1" (19mm)	95-100
1/2" (12.5mm)	25-60
No. 4 (4.75mm)	0-10
No. 8 (2.36mm)	0-5

- D. Top Course: Comply with the below criteria for ASTM #89 Stone, and the following gradation:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
1/2"	100
3/8"	85-100
No. 4	10-30
No. 8	0-15
No. 16	0-10
No. 200 (.074mm)	0-6

1. Soft lime stones and shale materials are not acceptable.
2. Questionable materials, as determined by the project geotechnical engineer, shall be tested at the Contractor's expense using a sulfate soundness test (ASTM C 88) and LA Abrasion Test (ASTM C 131) may be required depending upon source

<u>Test Method</u>	<u>Criteria</u>
Sulfate Soundness (ASTM C 88)	Not to exceed 12% Loss
LA Abrasion (ASTM C 131)	Not to exceed 40

- E. Aggregate material for bedding and backfill around the Drainage System shall be ASTM #57 Crushed Stone and shall meet criteria C above.

## 2.5 INDEPENDENT CRUSHED AGGREGATE PERMEABLE BASE TESTING

- A. Contractor to coordinate schedule as required for their independent testing agency subcontractor to continually monitor and test the crushed aggregate base as follows:
1. Sampling and testing of crushed aggregate permeable base both at the batch plant and on-site will be performed to confirm that the proposed material is in conformance with the project specifications prior to and following deliver of material to the site. Contractor's representative shall be in attendance at batch plant and at project site at time of material acquisition by the owner-provided independent testing agency.
  2. Batch plant sampling and testing shall consist of a minimum of two (2) gradation samples and two (2) permeability samples for the project for initial approval. Contractor shall continuously monitor the requirements in sections 1.4 and 2.3 above throughout placement of the crushed aggregate permeable base material.



3. On-site testing of the installed crushed aggregate permeable base shall be in accordance with section 1.4 above.
4. The Contractor's Testing Agent may choose to periodically inspect and/or obtain samples of aggregate materials at the source and/or as they are delivered or installed on site. Any rock aggregate material that does not conform to the approved submittal samples will be rejected immediately or tested by the Contractor Testing Agent to verify compliance with the specifications. Such tests shall imply no warranty of the Contractor's work or compliance with the specifications.
  - a. All costs for initial aggregate material testing, replacement for aggregate materials that were rejected by the Contractor's Testing Agent due to nonconformance with the specifications, and Contractor's submittals or quality control test results, will be borne by the Contractor.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATORY WORK**

- A. Examination of Site:
  1. Examine site for conditions that will adversely affect execution, permanence, and quality of work.
  2. Verify that underground utility & irrigation piping below sub-grade of synthetic turf base has been completed and the work of this section can properly proceed.
  3. The Contractor shall be responsible to close and cover, in a manner acceptable to the Owner, any existing basins, which the Owner determines to be detrimental to the function of the new synthetic turf field.

#### **3.2 EXCAVATION & SUB-GRADE PREPARATION**

- A. Methods as specified in appropriate section of the Contract Documents, and Sections 1.3 and 1.4 above.
- B. Subgrade grading and preparation shall comply with criteria outlined in the project geotechnical report as it relates to compaction, removal of existing turf, percent organic matter, debris, etc
  1. Sub-grade of the crushed aggregate permeable base material shall be sloped as shown on the drawings. Contractor's surveyor will verify proper elevation of the subgrade on 25' centers, and submit to the Engineer for approval. Contractor's surveyor shall be a licensed surveyor in the jurisdiction where the project is located, and shall be an independent sub consultant of the General Contractor
- C. Trench sub-grade locally as required to achieve design slopes on sub-drain collector pipes.
- D. Compaction:
  1. After sub-grade has been properly graded, contoured and sloped as required, compact soil materials as outlined in section 1.3 above.
- E. Tolerances:
  1. Compacted sub-grade shall conform to shall conform to section 1.3 above.

#### **3.3 TRENCH SEPARATION BARRIER**

- A. The prepared trench soil subsurface is to be isolated from the installed field and drainage system above it with the specified separation barrier placed across the entire surface of the trench.

- B. The subgrade surface shall be free from large stones; 3" or larger, and sharp objects that may puncture or tear the separation barrier.
- C. The separation barrier shall be placed and overlapped in accordance with the Manufacturer's written recommendations.
- D. The trench separation barrier shall be continuous through the drainage trenches to insure separation of surrounding soil and drainage stone

#### 3.4 PERFORATED HDPE DRAINAGE PIPE

- A. Examine the areas and conditions under which the subsurface drainage system work is to be installed. Correct any and all conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until satisfactory conditions have been corrected.
- B. EXCAVATION FOR PIPE
  - 1. Excavation shall consist of the removal of all material of every description to the depths and grades designated on the plans and specified herein.
  - 2. If the material at or below the designated grade for which the pipe is to be laid is unsuitable for pipe foundation, then the material shall be removed to such depths and widths as required and replaced with approved foundation material.
  - 3. Excavation for installation of pipes shall be in trenches to the lines, grades and widths as per the Contract Drawings.
- C. INSTALLATION
  - 1. Grades and widths, the geotextile fabric shall be installed as per Manufacturer's Specification.
  - 2. Perforated HDPE drainage pipe shall be installed according to recommended installation practices by the pipe manufacturer. Drain lines shall be installed to comply with drain line elevations noted on project plans.
  - 3. Pipe laying work shall commence at the main collector line and shall proceed upgrade. Pipe shall be laid true to line and grade in such a manner as to assure a close concentric joint with the adjoining pipe.
  - 4. Trenches shall be kept free of water and debris. Pipe shall not be laid when the condition of the trench or weather is unsuitable for such work.
  - 5. Install Panel Drains as shown on Drawings.
  - 6. At the completion of each drainage line installation, place a cap or plug in the up- stream end as to prevent unwanted material and debris from entering the pipe.
  - 7. Plug the downstream manhole outlet to prevent stormwater from being discharged prior to installation of the synthetic turf. Stormwater collected in the manhole shall be pumped to existing grass infiltration.
- D. INSPECTION
  - 1. After installation of pipe, inspect to determine whether line displacement or other damage has occurred.
  - 2. Make inspections after lines have been installed prior to backfilling, during the backfilling process, and again at the completion of backfilling. Backfill material shall conform to the material as specified in section 2.3 above.
  - 3. If inspection indicated poor alignment, debris, displaced pipe, infiltration or other defects, take whatever steps are necessary to correct such defects at no additional cost the Owner.

### 3.5 INSTALLATION OF HDPE DRAINAGE PIPE AND CRUSHED AGGREGATE PERMEABLE BASE

- A. Place permeable base materials in layers not more than 6 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
  - 1. Minimum nominal compacted thickness of base layer - 4 inches.  
Minimum nominal compacted to the topping stone layer – 2 inches.
- B. Place materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact permeable base materials to the following percentages of maximum dry unit weight according to ASTM D 1557:
  - 1. Crushed aggregate permeable base material shall be placed with adequate moisture content to prevent segregation of the particles during grading.
  - 2. Care shall be taken during placement and compaction of the crushed aggregate permeable base material in order to insure that the cement treated base is not damaged.
  - 3. Contractor to refer to compactions requirements as outlined in section 1.3 above.
- D. The finished elevations of the crushed aggregate permeable base shall meet all requirements as outlined in sections 1.3 and 1.4 above.

### 3.6 FIELD BOXES

- A. Install field boxes as required for all field appurtenances such as irrigation, quick coupler valves, electric outlets, etc. as specified elsewhere and as detailed.
- B. Backfill around field boxes with crushed aggregate permeable base material in lifts not to exceed 6 inches in loose depth and compact backfill using methods approved by the Geotechnical Engineer.
  - 1. Required compaction percentages around field boxes shall match requirements as outlines in section 1.3 above.

### 3.7 FIELD QUALITY CONTROL

- A. Proceed with subsequent work only once test results for previously completed work complies with requirements of section 1.3 and 1.4 above.
- B. When the Contractor's independent testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace materials to depth required; re-compact and retest until specified compaction is obtained.
- C. Areas that exhibit segregation of the crushed aggregate permeable base material shall be removed and replaced with properly moisture conditioned crushed aggregate permeable base material, compacted, and graded to the tolerances noted in this specification.

### 3.8 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, contamination from surrounding soils and erosion. Keep area free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, contaminated, or where they lose compaction due to subsequent construction operations or weather conditions.

## PART 4 - MEASUREMENT AND PAYMENT

### 4.1 Use one or more of the following unit bid item(s) as designated on the Bid Schedule.

- A. Synthetic Turf - Base Course:
  - 1. Bid Schedule Payment Reference: SP3.4.1.A.1
  - 2. Bid Schedule Description: –Synthetic Turf Base Course ... cubic yard (CY) per plan.
- B. Synthetic Turf - Top Course:
  - 1. Bid Schedule Payment Reference: SP3.4.1.B.1
  - 2. Bid Schedule Description: Synthetic Turf - Top Course ... cubic yard (CY) per plan.
- C. Field Drain Pipe - 12-inch Perforated Flat Drain: By the linear foot. Payment to be full compensation for all material, labor and equipment necessary to complete work including drain installation and geotextile fabric wrap (sock).
  - 1. Bid Schedule Payment Reference: SP3.4.1.C.1
  - 2. Bid Schedule Description: Field Drain Pipe - 12-inch Perforated Flat Drain...linear foot (LF).
- D. Field Drain Pipe - 12-inch Perforated Pipe: By the linear foot. Payment to be full compensation for all material, labor and equipment necessary to complete work including excavation, installation, geotextile, dewatering and backfill. Includes all trenching and rock drainage material up to the CTB elevation.
  - 1. Bid Schedule Payment Reference: SP3.4.1.D.1
  - 2. Bid Schedule Description: Field Drain Pipe - 12-inch Perforated Pipe ... linear foot (Lf).
- E. Field Drain Pipe - 18-inch Perforated Pipe: By the linear foot. Payment to be full compensation for all material, labor and equipment necessary to complete work including excavation, installation, geotextile, dewatering and backfill. Includes all trenching and rock drainage material up to the CTB elevation.
  - 1. Bid Schedule Payment Reference: SP3.4.1.E.1
  - 2. Bid Schedule Description: Field Drain Pipe - 18-inch Perforated Pipe ... linear foot (LF).
- F. Field Drain Basin: By each.
  - 1. Bid Schedule Payment Reference: SP3.4.1.F.1
  - 2. Bid Schedule Description: Field Drain Basin ...each (EA).
- G. Field Fine Blading / Pad Prep: incidental to Items SP-3.4.1.A.1 and SP-3.4.A.2.

## **SP-4 INFILLED SYNTHETIC TURF**

### **PART 1 GENERAL**

#### **1.1 SCOPE OF WORK**

Furnish all labor, materials, tools and equipment necessary to supply install, all synthetic turf materials, in accordance with the manufacturer's installation instructions, and in accordance with all approved shop drawings.

A. Prior to order of materials, submit the following:

1. Product Data, including Independent Test Lab Results
2. Installation Details including roll and seaming plan.
3. Sample Warranty
4. Field layout and striping plans
5. Installer Qualifications
6. Details on installation methods

B. Prior to the beginning of installation, the turf manufacturer shall inspect the base courses and supply a Certificate of Base Courses Acceptance for the purpose of obtaining manufacturer's warranty for the finished synthetic turf..

C. Prior to Final Completion, submit three (3) copies of Maintenance Manuals, which will include necessary instructions for the proper care and preventative maintenance of the synthetic turf system, including painting and striping.

#### **1.2 SHOP DRAWINGS**

A. Shop drawings shall be prepared at the scale of the construction documents and contain all pertinent information regarding installation for approval prior to the manufacturing and shipment of materials.

B. Shop drawings for:

1. Installation details; edge detail, goal post detail, other inserts and covers, etc.
2. Striping plan; layouts showing any field lines, markings and boundaries, and field layout tick marks per project drawings.

#### **1.3 QUALITY ASSURANCE**

A. Turf Installer Experience: The synthetic turf installer shall have manufactured and installed at least five (5) acceptable installations of sports fields in similar scale within the past five (5) years of synthetic turf products.

1. The Turf Installer shall employ only qualified, experienced supervisors and technicians skilled in the installation of the specified system.

2. Turf Installer Experience: Shall meet or exceed turf manufacturer requirements.
- B. Warranty: The warranty shall guarantee the usability and playability of the synthetic turf system for its intended uses for an eight (8) year period commencing with the date of Substantial Completion.
1. The warranty submitted must have the following characteristics:
    - a. Must provide coverage for eight (8) years from the date of Substantial Completion.
    - b. Must warrant materials and workmanship.
    - c. Must verify through a third party that the materials installed meet or exceed the product
    - d. Must have a provision to either make a cash refund or repair or replace such portions of the installed materials that are no longer serviceable to maintain a serviceable and playable service.
    - e. Must be a manufacturer's warranty from a single source covering workmanship and all self-manufactured or procured materials.
    - f. Provide a full eight-year third party insured warranty on the synthetic turf system, materials, and installation with an aggregate coverage of \$1,000,000.

## **PART 2 MATERIALS**

### **2.1 MATERIALS**

- A. Turf shall be Matrix® with Helix shape memory technology as manufactured by Hellas Construction, Inc., Contact Justin Rose, Hellas Construction, 23104 57th Ave West, Mount Lake Terrace, WA 98043, Mobile: (425) 248-8779; or approved equal.
1. Synthetic turf shall be comprised of helix-shaped dual color monofilament fibers tufted and coated with a secondary backing of high-grade polyurethane. The synthetic turf yarn shall be comprised of a C8-based linear low density polyethylene polymer (LLDPE) with a 10,000 PPM UV Stabilizer. The fibers shall be tufted to a finished pile height of 2" (+/- 1/8").
- B. Turf infill shall be The Natural Infill as manufactured by Hellas Construction, Inc., with natural rubber infill harvested from the rubber of Havea Brasilensis, incorporating cork of the Quercus Suber tree, or equal.

C. Shock Pad shall be G-Max Drain as manufactured by Hellas Construction, Inc., installed throughout the entire area to receive synthetic turf, or approved equal.

D. Required Turf Properties:

	Standard	Property	Specification
1	ASTM D418/D5848	Pile Weight	40 - 50 oz. /Sq. Yd.
2	ASTM D5848	Primary Backing Weight	7.9 oz./Sq. Yd.
3	ASTM D5848	Secondary Coating Weight	22 oz. /Sq. Yd.
4	ASTM D5848	Total Weight	69.9-79.9 oz. Sq. Yd.
5	ASTM D1907	Yarn Denier	12,400
6	ASTM D418-D5848	Pile Height	2" (+/-1/8")
7	ASTM D5793	Tufting Gauge	1/2"
8	ASTM D5848	Primary Backing	Tri-layer woven Polypropylene
9	ASTM D5848	Secondary Coating	Polyurethane
10	ASTM D1335	Tuft Bind without Infill	10 lbs. +/-
11	ASTM D1682/D5034	Grab Tear (length)	>300 lbs. Force
12	ASTM D1682/D5034	Grab Tear (width)	>350 lbs. Force
13	ASTM D4991	Carpet Permeability	>40 inches/hour
14	ASTM D2859	Flammability (Pill Burn)	Pass
15	ASTM F355	G-max (Impact Attenuation)	<135 at installation <165 over warranty life
16	ASTM E-11	Natural Rubber Infill	2.2 lbs +/- per square foot
17		Fabric Width	15'
18		Perforation	3/16" Holes 4" x 4"
19	ASTM D3218	Yarn	Average thickness 170 microns C8 LLDPE Resin 10,000 PPM UV Stabilizer
20	All characteristics listed above nominal +/- 5%		

## **PART 3 WORKMANSHIP**

### **3.1 GENERAL**

- A. Only qualified personell skilled in the installation of athletic caliber synthetic turf systems working under the direct supervision of the synthetic turf manufacturer's installation supervisors shall undertake the placement of the system.
- B. The surface to receive the synthetic turf shall be inspected and certified by the turf manufacturer as ready for the installation of the synthetic turf system and must be perfectly clean as installation commences and shall be maintained in that condition throughout the process.
- C. Color of the synthetic turf to be approved by the Owner's Representative. The field is intended to be one consistent green

color (no alternating green panels), and a brown color for baseball and softball infields. Fiber used for baseball and softball infields, lines, and markings shall be of the same composition as that used for the green areas.

- D. As applicable, provide game markings as follows: football, soccer, lacrosse layout tick marks, and related markings shall be cut in and glued in accordance with Synthetic Turf System Provider's recommendations.
- E. The turf shall be delivered per manufacturer's guidelines. The rolls shall be of sufficient length to go from touch line to touch line. Head seams, between the touch lines, will not be acceptable. Provide Field lines and markings as follows.
  - 1. Football: Four-inch wide lines, Color – white. Font shall be Clarendon solid filled, Color – White, Height – six feet.
  - 2. Soccer: Four-inch wide lines, Color – yellow.
  - 3. Baseball/Softball: Four-inch wide lines, Color – white. First and Third base lines shall be cut in and glued within brown infield. Place 4" x 4" white tick marks at baseball 320' outfield foul line points and softball 210' outfield foul line points for reference for future layout and painting of foul lines from cut in infield baselines to outfield extents.
  - 4. Lacrosse: Provide 4" x 4" blue turf tick marks for layout of future painted striping for lacrosse. Provide tick marks at all lacrosse field corners, end lines, and center of radius.

### 3.2 INSTALLATION

- A. All Work shall be performed in accordance with the Contract Documents, shop drawings, and manufacturer's installation requirements.
- B. All access boxes located within synthetic turf shall be installed in conjunction with placement of base course aggregate subbase material. Verify proper depth dimensions of access boxes per actual field locations as cement treated base slope, and base course depth varies.
- C. The subbase aggregate base course and top course, turf edges including nailer board, and turf boxes shall be inspected and accepted by Turf Installer.
- D. The shock pad shall be laid on a clean debris free top course after planarity of top course, nailer board, and boxes are verified and approved by Turf Installer. Install shock pad per



manufacturer's recommendations including proper panel connections.

- E. Following completed install of shock pad, synthetic turf shall be loose laid across the field and attached to the perimeter edge details. Turf shall be of sufficient length to permit full cross-field installation. No head or cross seams will be allowed, except as required for inlaid fabric striping or to accommodate programmed cut-outs.
- F. All seams shall be flat, tight, and permanent with no separation or fraying. All seams and markings shall be adhered to a special tape with a single component, high strength polyurethane adhesive applied per the Turf Installer's standard procedures for outdoor applications.
- G. Infill materials shall be properly applied in numerous thin lifts using special broadcasting equipment to produce a layered system of infill particles. The turf shall be raked and brushed properly as the mixture is applied. The infill materials can only be applied when the turf fabric is dry.

### 3.3 CLEAN UP

- F. All usable remnants of new material shall become the property of the Owner.
- G. Surfaces, recesses, enclosures, etc., shall be cleaned as necessary to leave the work area in a clean, immaculate condition ready for use by the specified Contract Times.

### 3.4 G-MAX SHOCK ATTENUATION MANDATORY REQUIREMENT

- A. The following obligations placed on the Turf Installer are subject to the terms and conditions of the Turf Installer's Warranty and the maintenance guidelines, requirements and recommendations provided by the Turf Installer to the Owner have consistently been completed in a timely and professional manner.
- B. Required Test Method:
  - 1. The required test method for determining the various G-max values as detailed within this section is ASTM F355-01 - Standard Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials. All results must be stated to include both the standard G-max value based on ASTM F355-01, and the Head Injury Coefficient (HIC).
- C. Required G-max Values and Limits at Time of Installation:
  - 1. The maximum G-max Value at time of installation shall not exceed 135G.

D. Lifecycle G-max Values:

1. The maximum G-max Value throughout the warranted lifecycle of the synthetic turf playing surface is not to exceed 165G.
2. The HIC Value throughout the warranted lifecycle of the synthetic turf playing surface is not to exceed 1000.

**PART 4 MEASUREMENT AND PAYMENT**

4.1 SECTION INCLUDES

- a. Infilled Synthetic Turf System: Measurement and payment shall be by the Square Foot. Work includes full compensation for all materials, labor and equipment necessary for completing the installation of the synthetic turf system from the top surface of top course aggregate upward including shock pad, synthetic turf with striping, infill material, and nailer board. The warranty is incidental to this item.
  1. Bid Schedule Payment Reference: SP4.4.1.A.1
  2. Bid Schedule Description: Install Synthetic Turf System by square foot (SF).

END OF SECTION

## **SP-5 - SYNTHETIC TURF ALTERNATE #1**

This Alternate #1 consists of modifying the Contract Documents to delete SP4 – Part 2, Materials in its entirety and replace with this Section, SP5 – Synthetic Turf Alternate #1. Liquidated damages and all other terms and conditions of the Contract remain in full force and effect. Acceptance of this Alternate does not modify any other Bid items included in Schedule A – Base Bid. Acceptance of this Alternate deletes Bid Schedule Payment Reference: SP4.4.1.A.1 and replaces it with Schedule B – Alternate #1.

### **PART 2 - MATERIALS**

#### **2.1 ALTERNATE SYNTHETIC TURF SYSTEM,**

##### **A. APPROVED SYNTHETIC TURF PRODUCTS**

1. Astro Turf, Contact: Steve Webb, Coast to Coast Turf, 5816 S Thomas Mallen Rd Cheney, WA 99004, Mobile: 509 953-16078; Product: Astroturf Rhino Blend – Monofilament and slit film blend (2" Pile Height).
2. SprinTurf, Contact: Tom Burlingame, SprinTurf, 4777 Exeter St., West Linn, OR 97068 Mobile (503) 318-9448; Product: SprinTurf Ultrablade DFE Extreme 46 (non-thatch) – Monofilament and slit film blend. (2" Pile Height).
3. Shaw Sports Turf, Contact: Kevin Senf, Shaw Sports Turf, 19312 205th St E Orting, WA 98360, Mobile: 512-627-2220; Product: Shaw Sports Turf Legion HP (2" Pile Height).
4. Hellas Construction, Contact: Justin Rose, Hellas Construction, 23104 57<sup>th</sup> Ave West, Mount Lake Terrace, WA 98043, Mobile: (425) 248-8779; Product: Hellas Fusion 46 (2" Pile Height).

- B. All components of the synthetic turf system and their installation methods shall be designed and manufactured primarily for outdoor athletic fields. The materials as specified shall be able to withstand full climatic exposure in Northern Idaho and compatible with the related systems detailed in the Contract documents.
- C. The primary pile fiber shall be 100% polyethylene athletic quality yarn specifically designed All components shall be resistant to weather, insect infestation, rot, fungus, mildew, ultraviolet light and heat degradation and shall be non-toxic.
- D. The synthetic turf system shall have the basic characteristic of a flow-through drainage system allowing free movement of surface water through the turf, where such water may flow to the sub-base and into the field drainage system. The permeability of the synthetic turf system (with infill) shall be a minimum of twenty (20) inches per hour. Certified test results will be required from a Owner-approved testing laboratory.
- E. All synthetic turf systems options shall meet or exceed the following minimum specifications and requirements for a dual fiber, slit-film and monofilament combination fibers tufted into a primary backing with a secondary backing and resilient infill system consisting of cork granules and silica sand.

<b>Item</b>	<b>ASTM</b>	<b>Property</b>	
1.	D418	Yarn Denier/Ply (Slit Film)	5,000/1
2.	D418	Yarn Denier/Ply (Mono)	10,000/6
3.	D418	Pile weight (total)	40-50 oz/sq yard
4.	D418	Primary Backing	7 oz/sq yard
5.	D418	Secondary Backing	16 oz/sq yard
6.	D418	Total Weight	66 oz/sq yard
7.	D418	Pile Height	2 inch
8.	D1335	Tuft Bind	8 lbs
9.	D1682	Grab/Tear Strength	200 lbs
10.	D2858	Pill Burn	Pass

## 2.2 SYNTHETIC TURF INFILL MATERIALS

- A. A resilient infill system, consisting of a typically formulated mixture of cork and sand engineered to provide the look, feel, footing and shock absorption of a natural grass field in ideal conditions. Cork and sand ratio – 1lb. cork to 4lbs. sand or as required by the vendor to meet the minimum specifications required.
- B. Cork Granules. Greenplay Organics PFC: Pure Cork Performance Infill, or approved equal. Particle Size: 1 – 2.5 mm [www.greenplayusa.com](http://www.greenplayusa.com)
- C. Sand Particulate. The sand provided as a component of the infill mixture shall be rounded or sub-angular washed and dried so as to minimize abrasion to the athlete and synthetic grass fibers.

Sieve Size	Percent Retained
1. #16	0%-5%
2. #20	10%-20%
3. #30	50%-70%
4. #40	15%-25%
5. #50	0%-10%
6. #100	0%-5%
7. Pan	0%-2%

## 2.3 SYNTHETIC TURF SHOCK PAD

- A. Brock ShockPad Series 17mm or approve equal. [www.brockusa.com](http://www.brockusa.com)
  - a. Approved Equal: EnPlast ShockDrain 580 perforated. [www.en-plast.us](http://www.en-plast.us)
  - b. Approved Equal: ProPlay Sport 20 20mm. [www.schmitzfoam.com](http://www.schmitzfoam.com)

## **SP6 - CHAIN-LINK FENCES & GATES**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Fence framework, fabric, and accessories.
- B. Excavation for post bases; concrete foundation for posts.
- C. Manual gates and related hardware.
- D. Baseball & Softball backstop netting posts and netting installation.
- E. Football safety netting posts and netting installation.

#### **1.2 RELATED SECTIONS**

- A. Section 703 – Cast-in-Place Concrete

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes of the following:
    - a. Fence and gate posts, rails, and fittings.
    - b. Chain-link fabric, reinforcements, and attachments.
    - c. Gates and hardware.
- B. Shop Drawings:
  - 1. For each type of fence and gate assembly.
    - a. Include plans, elevations, sections, details, and attachments to other work.
    - b. Include accessories, hardware, and operational clearances.
  - 2. For backstop netting, and cable rigging system.
    - a. Include plans, elevations, sections, and details with an Idaho professional engineer certification verifying adequate sizing of rigging hardware, connections, and cabling to withstand loads on the system and ensure safe operation.

#### **1.4 INFORMATIONAL SUBMITTALS**

- A. Product Certificates: For each type of chain-link fence, and gate.
- B. Product Test Reports: For framework strength according to ASTM F1043, for tests performed by a qualified testing agency.
- C. Sample Warranty: For special warranty.

#### **1.5 QUALITY ASSURANCE**

- A. Manufacturer's Qualifications: Company specializing in manufacturing products specified in this section, with not less than (5) five years of documented experience.
- B. Installer's Qualifications: Installer specializing in the installation of products and work specified in the section

#### **1.6 FIELD CONDITIONS**

- A. Field Measurements: Verify layout information for chain-link fences, posts, gates, and netting posts shown on Drawings in relation to property survey and existing structures. Verify dimensions of field measurements. Fence and netting post

locations are critical to overall project layout. Layout of various fence post locations are key under this contract which are critical to construction improvements of future phases.

## 1.7 WARRANTY

- A. Special Warranty: Installer agrees to repair or replace components of chain-link fences, gates, and netting systems that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to the following:
    - a. Failure to comply with performance requirements.
    - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
  - 2. Warranty Period: Contractor shall warrant work as provided by the General and Supplementary conditions.

## PART 2 – MATERIALS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Chain-link fence and gate frameworks shall withstand the design wind loads and stresses for fence height(s) and under exposure conditions indicated according to ASCE/SEI 7.
- B. Lighting Protection System: Maximum resistance-to-ground value of 25 ohms at each grounding location along fence under normal dry conditions.

### 2.2 CHAIN-LINK FENCE FABRIC

- A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle according to “CLFMI Product Manual” and requirements indicated below:
  - 1. Fabric Height: As indicated on Drawings and per Table 1.
  - 2. Steel Wire for Fabric: Wire diameter of 0.148 inch (3.76mm), 9-Gauge.
    - a. Mesh Size: 2 inches (50mm).
    - b. Zinc-Coated Steel Fabric: ASTM A392 hot dipped galvanized before or after weaving.
      - i. Class I – 1.2 oz/ft<sup>2</sup> (366 g/m<sup>2</sup>)
  - 3. Selvage: Knuckled at both selvages (Top and Bottom)

### 2.3 STEEL FENCE FRAMEWORK

- A. Round Steel Pipe and Rail: ASTM F1043 Group IA Heavy Industrial Fence Framework, schedule 40 hot dipped galvanized pipe per ASTM F1083. Exterior hot dipped zinc coating minimum average 1.8oz/ft<sup>2</sup>. Regular Grade Strength.
  - 1. Fence Height: As indicated on Drawings and per Table 1
  - 2. Line Post: Refer to Table 1
  - 3. End, Corner, Pull Post: Refer to Table 1
  - 4. Top brace, bottom, and intermediate rails, 1.660 in. (42.2mm) O.D., 2.27 lbs./ft (3.38kg/m).

**TABLE 1**

<b>Fence Fabric Height</b>	<b>Footing Depth (Below Grade)</b>	<b>Footing Diameter *</b>	<b>Line Post</b>	<b>End Post</b>	<b>Terminal Post</b>
6 foot	36-inch	18-inch	1 7/8" O.D.	1 7/8" O.D.	1 7/8" O.D.
8 foot	36-inch	18-inch	2 3/8" O.D.	2 7/8" O.D.	2 7/8" O.D.
12 foot	48-inch	24-inch	3 1/2" O.D.	3 1/2" O.D.	3 1/2" O.D.
Football Security Netting Post (40ft. Ht. Above Grade)	12'-6"	36-inch	7" O.D.	7" O.D.	7" O.D.
Baseball Backstop Netting Post (40ft. Ht. Above Grade)	12'-6"	36-inch	6 5/8" O.D.	6 5/8" O.D.	6 5/8" O.D.
Softball Backstop Netting Post (30ft. Ht. Above Grade)	12'-6"	36-inch	6 5/8" O.D.	6 5/8" O.D.	6 5/8" O.D.

*\* (Rebar Reinforcement Minimum Requirements: (4) #4 Verticals and #3 Ties at 12" O.C. Maximum.)*

## 2.4 SWING GATES

- A. General: ASTM F900 for gate posts and single and double swing gate types.
  - 1. Gate Leaf Width(s): As indicated on Drawings
  - 2. Framework Member Sizes and Strength: Based on gate fabric height as indicated on Drawings.
- B. Pipe and Tubing:
  - 1. Zinc-Coated Steel: ASTM F1043 and ASTM F1083; hot dipped galvanized to match coating and finish of framework.
  - 2. Gate Posts: Round tubular steel.
  - 3. Gate Frames and Bracing: Round tubular steel.
- C. Frame Corner Construction: Welded.
- D. Extended Gate Posts and Frame Members: Fabricate gate posts and frame end members to extend zero inches (00mm) above top of chain-link fabric at both ends of gate frame.
- E. Hardware:
  - 1. Hinges: 180-degree swing as indicated on Drawings.
  - 2. Latch: Permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.
  - 3. Padlock and Chain: Padlock(s) provided by owner.

## 2.5 FITTINGS

- A. Provide fittings according to ASTM F626.
- B. Post Caps: Provide for each post.

1. Provide line post caps with loop to receive top rail.
- C. Rail and Brace Ends: For each gate, corner, pull, and end post.
- D. Rail Fittings: Provide the following:
  1. Top Rail Sleeves: Round steel tubing, not less than 6-inches (152mm) long.
  2. Rail Clamps: Line and corner boulevard clamps for connecting top, intermediate, and bottom rails to posts.
- E. Tension and Brace Bands: Pressed Steel.
- F. Tension Bars: Aluminum, length not less than 2-inches (50mm) shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.
- G. Truss Rod Assemblies: Hot dipped galvanized after threading rod and turnbuckle or other means of adjustment.
- H. Tie Wires, Clips, and Fasteners: According to ASTM F626.
  1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, according to the following:
    - a. Hot Dipped Galvanized Steel: 0.106-inch (2.69mm) diameter wire matching coating thickness of chain-link fence fabric.
- I. Finish:
  1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2oz/sq. ft. (366 g/sq. m) of zinc.
  2. Aluminum: Mill Finish

## 2.6 BACKSTOP/FOOTBALL NETTING SYSTEM

- A. Netting Posts: ASTM F 1083 Schedule 80 steel pipe. Hot dipped galvanized.
- B. Winch/Cable Mounting System: as indicated on the drawings.
- C. Netting (Owner Furnished Contractor Installed): Beam Clay - #48 Braided Knotted Polyethylene, Product No. 26030, 3.0mm, 1-3/4" square mesh with 285 lb. breaking strength. Extruded, solid core. Vinyl Border with grommets every 18". Or Equal.

## 2.7 GROUNDING MATERIALS

- A. Comply with requirements in Section 260526 "Grounding and Bonding for Electrical Systems."
- B. Connectors and Grounding Rods: Listed and labeled for complying with UL467.
  1. Connectors for Below-Grade Use: Exothermic welded type.
  2. Grounding Rods: Copper-clad steel, 5/8 by 96-inches (16 by 2440mm).

# PART 3 – WORKMANSHIP

## 3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for a certified survey of property lines and legal boundaries, site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.
  1. Do not begin installation before final grading is completed unless otherwise permitted by Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION



- A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet (152m) or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

### 3.3 CHAIN-LINK FENCE INSTALLATION

- A. Install chain-link fencing according to ASTM F567 and more stringent requirements specified.
  - 1. Install fencing on established boundary lines inside property line.
- B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil. Coordinate with Cement Treated Base (CTB) installation.
- C. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil. Coordinate with Cement Treated Base (CTB) installation.
  - 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
  - 2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
    - a. Concealed Concrete: Place top of concrete below grade to allow covering with surface materials as indicated per details and drawings. Do not stretch fabric until concrete foundation has cured a minimum of seven days.
    - b. Post Embed Depth: Minimum embed depth shall be 2'-6" in footing. Depth may need to be deeper based on surface construction elements and CTB placement. Coordinate with other trades and verify required depth in field.
- D. Terminal Posts: Install terminal end, corner, and gate posts according to ASTM F567 and terminal pull posts at changes in horizontal or vertical alignment as indicated on Drawings. For runs exceeding 500 feet (152m), space pull posts an equal distance between corner or end posts.
- E. Line Posts: Space line posts as indicated on Drawings. If not indicated, space uniformly at 10 feet (3m) on center.
- F. Post Bracing and Intermediate Rails: Install according to ASTM F567, maintaining plumb position and alignment of fence posts. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.
  - 1. Locate horizontal braces at mid-height of fabric 72-inches (1830mm) on 12ft. fences. Install so posts are plumb when diagonal rod is under proper tension.
- G. Top Rail: Install according to ASTM F567, maintaining plumb position and alignment of fence posts. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.
- H. Intermediate and Bottom Rails: Secure to posts with fittings.
- I. Chain-Link Fabric: Apply fabric to field side of enclosing framework. Leave 2-inch (50mm) bottom clearance between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

- J. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts, with tension bands spaced not more than 15-inches (380mm) on center.
- K. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180-degrees, and attach other end to chain-link fabric according to ASTM F626. Bend ends of wire to minimize hazards to individuals and clothing. All wrapped wire twists should be opposite fabric side.
  - 1. Maximum Spacing: Tie fabric to line posts at 12-inches (300mm) on center and to braces at 24-inches (610mm) on center.
- L. Fasteners: Install nuts for tension bands and carriage bolts on the side of fence opposite fabric side.

### 3.4 GATE INSTALLATION

- A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-site items in concrete for anchorage. Adjust hardware for smooth operation.

### 3.5 GROUNDING AND BONDING

- A. Fence and Gate Grounding:
  - 1. Ground for fence and fence posts shall be a separate system from ground for gate and gate posts.
  - 2. Install ground rods and connections at maximum intervals of 1,500 feet (450m).
  - 3. Fences within 100 feet (30m) of Buildings, Structures, Walkways, and Roadways:
    - a. Ground at maximum intervals of 750 feet (225m).
  - 4. Ground fence on each side of gates and other fence openings.
    - a. Bond metal gates to gate posts.
    - b. Bond across openings, with and without gates, except openings indicated as intentional fence discontinuities. Use No. 2 AWG wire and bury it at least 18-inches (457mm) below finished grade.
- B. Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing and at a ground rod located a maximum distance of 150 feet (45m) on each side of crossing.
- C. Fences Enclosing Power Distribution Equipment: Ground according to IEEE C2 unless otherwise indicated.
- D. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6-inches (152mm) below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at grounding location.
- E. Connections:
  - 1. Make connections with clean, bare metal at points of contact.
  - 2. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
  - 3. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
  - 4. Make above-grade ground connections with mechanical fasteners.
  - 5. Make below-grade ground connections with exothermic welds.

- 6. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
- F. Bonding to Lightning Protection System: Ground fence and bond fence grounding conductor to lightning protection down conductor or lightning protection grounding conductor according to NFPA 780.
- G. Comply with requirements in Section 264113 "Lightning Protection for Structures".

### 3.6 ERECTION TOLERANCES

- A. Maximum Variation from Plumb: 1/4"
- B. Maximum Offset from True Position: 1-inch
- C. Components shall not infringe adjacent property lines.

### 3.7 ADJUSTING

- A. Gates: Adjust gates to operate smoothly, easily, and quietly. Free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Netting Winch/Pulley System: Adjust winches, pulleys, and cabling and connections for system to operate free of binding, nonalignment, disruption, or malfunction, through the entire operating range. Confirm that winch latches and locks engage securely. Adjust cabling to ensure a secure taught line between posts with netting fully raised and installed.
- C. Lubricate hardware and other moving parts.

## PART 4 – MEASUREMENT AND PAYMENT

### 4.1 SECTION INCLUDES:

- A. 6ft Ht. Galvanized Chain-link Fence – Includes all labor, materials, and equipment to install chain-link fence(s) per plans. Includes all associated hardware, fasteners, connectors, fabric, rails, posts, and footings. Pay item shall be per linear foot.
  - 1. Bid Schedule Payment Reference: SP6.4.1.A
  - 2. Bid Schedule Description: 6ft Ht. Galvanized Chain-link Fence

### 4.2 SECTION INCLUDES:

- A. 8ft Ht. Galvanized Chain-link Fence – Includes all labor, materials, and equipment to install chain-link fence(s) per plans. Includes all associated hardware, fasteners, connectors, fabric, rails, posts, and footings. Pay item shall be per linear foot.
  - 1. Bid Schedule Payment Reference: SP6.4.2.A
  - 2. Bid Schedule Description: 8ft Ht. Galvanized Chain-link Fence

### 4.3 SECTION INCLUDES:

- A. 12ft Ht. Galvanized Chain-link Fence – Includes all labor, materials, and equipment to install chain-link fence(s) per plans. Includes all associated hardware, fasteners, connectors, fabric, rails, posts, and footings. Pay item shall be per linear foot.
  - 1. Bid Schedule Payment Reference: SP6.4.3.A
  - 2. Bid Schedule Description: 12ft Ht. Galvanized Chain-link Fence

### 4.4 SECTION INCLUDES:

- A. 6ft Ht. x 16ft Wide Double Swing Chain-link Gate – Includes all labor, materials, and equipment to install chain-link gate(s) per plans. Includes all associated hardware, fasteners, connectors, fabric, rails, posts, stops, latches, and footings. Pay item shall be per linear foot.
  - 1. Bid Schedule Payment Reference: SP6.4.4.A
  - 2. Bid Schedule Description: 6ft Ht. x 16ft Wide Double Swing Chain-link Gate

4.5 SECTION INCLUDES:

- A. 8ft Ht. x 4ft Wide Single Swing Chain-Link Gate – Includes all labor, materials, and equipment to install chain-link gate(s) per plans. Includes all associated hardware, fasteners, connectors, fabric, rails, posts, stops, latches, and footings. Pay item shall be per linear foot.
  - 1. Bid Schedule Payment Reference: SP6.4.5.A
  - 2. Bid Schedule Description: 8ft Ht. x 4ft Wide Single Swing Chain-Link Gate

4.6 SECTION INCLUDES:

- A. 8ft Ht. x 14ft Wide Double Swing Chain-link Gate – Includes all labor, materials, and equipment to install chain-link gate(s) per plans. Includes all associated hardware, fasteners, connectors, fabric, rails, posts, stops, latches, and footings. Pay item shall be per linear foot.
  - 1. Bid Schedule Payment Reference: SP6.4.6.A
  - 2. Bid Schedule Description: 8ft Ht. x 14ft Wide Double Swing Chain-link Gate

4.7 SECTION INCLUDES:

- A. 8ft Ht. x 8ft Wide Double Swing Chain-Link Gate – Includes all labor, materials, and equipment to install chain-link gate(s) per plans. Includes all associated hardware, fasteners, connectors, fabric, rails, posts, stops, latches, and footings. Pay item shall be per linear foot.
  - 1. Bid Schedule Payment Reference: SP6.4.7.A
  - 2. Bid Schedule Description: 8ft Ht. x 8ft Wide Double Swing Chain-Link Gate

4.8 SECTION INCLUDES:

- A. 12ft Ht. x 14ft Wide Double Swing Chain-link Gate – Includes all labor, materials, and equipment to install chain-link gate(s) per plans. Includes all associated hardware, fasteners, connectors, fabric, rails, posts, stops, latches, and footings. Pay item shall be per linear foot.
  - 1. Bid Schedule Payment Reference: SP6.4.8.A
  - 2. Bid Schedule Description: 12ft Ht. x 14ft Wide Double Swing Chain-link Gate

4.9 SECTION INCLUDES:

- A. 12ft Ht. x 4ft Wide Single Swing Chain-Link Gate – Includes all labor, materials, and equipment to install chain-link gate(s) per plans. Includes all associated hardware, fasteners, connectors, fabric, rails, posts, stops, latches, and footings. Pay item shall be per linear foot.
  - 1. Bid Schedule Payment Reference: SP6.4.9.A
  - 2. Bid Schedule Description: 12ft Ht. x 4ft Wide Single Swing Chain-Link Gate

#### 4.10 SECTION INCLUDES:

- A. 12ft Ht. x 8ft Wide Single Swing Chain-Link Gate – Includes all labor, materials, and equipment to install chain-link gate(s) per plans. Includes all associated hardware, fasteners, connectors, fabric, rails, posts, stops, latches, and footings. Pay item shall be per linear foot.
  - 1. Bid Schedule Payment Reference: SP6.4.10.A
  - 2. Bid Schedule Description: 12ft Ht. x 8ft Wide Single Swing Chain-Link Gate

#### 4.11 SECTION INCLUDES:

- A. Football Safety Netting Posts (30ft. Above Grade) – Includes all labor, materials, and equipment to install football safety netting posts. Includes survey, layout, excavation, footings, posts, winches, pulleys, cable, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per each.
  - 1. Bid Schedule Payment Reference: SP6.4.11.A
  - 2. Bid Schedule Description: Football Safety Netting Posts (30ft. Above Grade)

#### 4.12 SECTION INCLUDES:

- A. Baseball Backstop Netting Posts (40ft. Above Grade) – Includes all labor, materials, and equipment to install baseball backstop netting posts. Includes survey, layout, excavation, footings, posts, winches, pulleys, cable, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per each.
  - 1. Bid Schedule Payment Reference: SP6.4.12.A
  - 2. Bid Schedule Description: Baseball Backstop Netting Posts (40ft. Above Grade)

#### 4.13 SECTION INCLUDES:

- A. Softball Backstop Netting Posts (30ft. Above Grade) – Includes all labor, materials, and equipment to install softball backstop netting posts. Includes survey, layout, excavation, footings, posts, winches, pulleys, cable, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per each.
  - 1. Bid Schedule Payment Reference: SP6.4.13.A
  - 2. Bid Schedule Description: Softball Backstop Netting Posts (30ft. Above Grade)

#### 4.14 SECTION INCLUDES:

- A. Baseball Backstop Netting Installation – Includes all labor, materials, and equipment to install baseball backstop netting. Includes netting (Owner Provided), cable, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per square foot (SF).
  - 1. Bid Schedule Payment Reference: SP6.4.14.A
  - 2. Bid Schedule Description: Baseball Backstop Netting.

4.15 SECTION INCLUDES:

A. Softball Backstop Netting Installation – Includes all labor, materials, and equipment to install softball backstop netting. Includes, netting (Owner Provided), cable, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per square foot (SF).

1. Bid Schedule Payment Reference: SP6.4.15.A
2. Bid Schedule Description: Softball Backstop Netting.

4.16 SECTION INCLUDES:

A. Football Safety Netting Installation – Includes all labor, materials, and equipment to install football safety netting. Includes, netting (Owner Provided), cable, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per square foot (SF).

1. Bid Schedule Payment Reference: SP6.4.16.A
2. Bid Schedule Description: Football Safety Netting.

END OF SECTION

## **SP7 - STEEL HELICAL PIERS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. The work of this section consists of furnishing and installing steel Helical Piers® manufactured by the A.B. Chance Company, Centralia, Missouri or approved substitute.
- B. Steel Helical Piers® shall be designed and installed to resist the unfactored design loads as shown on Sheet S-3.0. Reference the geotechnical report for the site dated January 20, 2020 prepared by Allwest Testing for additional information on the Helical Piers.

#### **1.2 QUALITY ASSURANCE**

- A. Installer Qualifications: Installation shall be done by an A.B. Chance Company or approved substitute authorized installation contractor. Proof of current certification with the A.B. Chance Company or approved substitute shall be submitted to the Owner prior to starting installation. Verification may be obtained from Rocky Mountain Steel Foundations Inc. 406-756-PIER (7437)
- B. A qualified inspector shall be present during Helical Pier® installation as requested by the Owner.
- C. Welding: Meet requirements of AWS "Structural Welding Code," D1.1, latest edition. All welders shall be AWS certified.
- D. Steel Helical Piers® as specified shall be manufactured by a facility whose quality control systems comply with ISO (International Organization of Standardization) 9001 requirements. Certificates of Registration denoting ISO Standards Number shall be presented upon request to the Owner.

#### **1.3 SUBMITTALS**

- A. Submit shop drawings indicating shaft and helix sizes, and include manufacturer's catalog cut and data sheets.

### **PART 2 - PRODUCTS**

#### **2.1 MATERIAL**

- A. The steel Helical Piers® shall be International Code Council listed. Installing contractor shall furnish evidence to the Owner by means of the ICC Evaluation Report.
- B. Pier Shafts (Lead Section and Extensions):
  - 1. The 1.5 inch (38.1 mm) round cornered square (RCS) solid steel shafts shall conform to the general requirements of ASTM A29 and the following descriptions:
    - a. Modified medium carbon steel grade (similar to ASTM 1044) with improved strength due to fine grain size and structure having a torsional strength rating of 5,700 ft.-lbs. (7.46 kN-m)(760 kgf-m), or

- b. High strength low alloy (HSLA), low to medium carbon steel grade (similar to ASTM 1530) with improved strength due to fine grain size and structure having a torsional strength rating of 7,000 ft.-lbs (9.49 kN-m)(968 kgf-m).
  2. The 1.75 inch (44.5 mm) round cornered square (RCS) solid steel shafts shall conform to the general requirements of ASTM A29 and the following descriptions:
    - a. High strength low alloy (HSLA), low to medium carbon steel grade (similar to AISI 1530) with improved strength due to fine grain size and structure having a torsional strength rating of 11,000 ft.-lbs (13.6 kN-m)(1,380 kgf-m).
  3. The 2.0 inch (50.8 mm) round cornered square (RCS) solid steel shafts shall conform to the general requirements of ASTM A29 and the following descriptions:
    - a. High strength low alloy (HSLA), low to medium carbon steel grade (similar to AISI 1530) with improved strength due to fine grain size and structure having a torsional strength rating of 16,000 ft.-lbs (21.7 kN-m)
  4. The 2.25 inch (57.2 mm) round cornered square (RCS) solid steel shafts shall conform to the general requirements of ASTM A29 and the following descriptions
    - a. High strength low alloy (HSLA), low to medium carbon steel grade (similar to AISI 1530) with improved strength due to fine grain size and structure having a torsional strength rating of 21,000 ft.-lbs (28.4 kN-m).
- C. Helices: Carbon steel sheet, strip, or plate formed on matching metal dies to true helical shape and shall conform to the following ASTM specifications:
  1. 5,700 ft.-lbs.(7.46 kN-m)(760 kgf-m) 1.5 inch (38.1 mm) Piers: ASTM A607, A570, or A572 Grade 50 or 80.
  2. 7,000 ft.-lbs.(9.49 kN-m)(968 kgf-m) 1.5 inch (38.1 mm) Piers: ASTM A607, A570, or A572 Grade 80.
  3. 11,000 ft.-lbs.(13.6 kN-m)(1,380 kgf-m) 1.75 (44.5 mm) inch Piers: ASTM A715 Grade 80.
  4. 16,000 ft.-lbs.(21.7 kN-m) 2.25 (57.2 mm) inch Piers: ASTM A656 or A1018 Grade 80.
  5. 21,000 ft.-lbs.(28.4 kN-m) 2.25 (57.2 mm) inch Piers: ASTM A656 or A1018 Grade 80.
- D. Bolts: The sizes and types of bolts used to connect the Helical Pier® extensions to lead sections or another extension shall conform to the following ASTM specifications:
  1. 1.5 inch (38.1 mm) Helical Piers®: 0.75 inch (19.1 mm) diameter bolt per ASTM A320 Grade L7.
  2. 1.75 inch (44.5 mm) Helical Piers®: 0.875 inch (22.2 mm) diameter bolt per ASTM A193 Grade B7.



- E. Couplings: Couplings will be formed as an integral part of (rcs) shaft extension material through an upset forging process. Welded couplings are not allowed.
- F. Finish: All material shall have a Class B-1 hot dipped galvanized coating complying with ASTM A153

## **PART 3 - WORKMANSHIP**

### **3.1 EQUIPMENT**

#### **A. Installation Equipment:**

1. Shall be a rotary type motor with equal forward and reverse torque capabilities. This equipment shall be capable of continual adjustment of the torque drive unit's revolutions per minute (RPM's) during installation. Percussion drilling equipment will not be allowed.
2. Shall be capable of applying installation torque equal to the torque required to meet the pier loads.
3. Equipment shall be capable of applying axial compression (crowd) pressure and torque simultaneously.

#### **B. Torque Monitoring Devices:**

1. The torque being applied by the installing units shall be monitored throughout the installation by the installer. The torque monitoring device shall either be a part of the installing unit or an independent device in-line with the installing unit. Calibration for either unit shall be available for review by the Owner.

### **3.2 INSTALLATION PROCEDURES:**

#### **A. Advancing Sections:**

1. Engage and advance the Helical Pier® sections in a smooth, continuous manner with the rate of pier rotation in the range of 5 to 35 RPM.
2. Apply sufficient axial compression (crowd) pressure to uniformly advance the helical sections to approximately 3-inches (76.2 mm) per revolution. The rate of rotation and magnitude of crowd pressure must be adjusted for different soil conditions and depths in order to maintain the penetration rate.
3. If the helical section ceases to advance, refusal will have been reached and the installation shall be terminated.

#### **B. Termination Criteria:**

1. The torque as measured during the installation shall not exceed the torsional strength rating of the steel helical lead and extension sections.
2. The minimum depth criteria indicated on the Drawings must be satisfied prior to terminating the steel Helical Pier.
3. The top helix is to be located not less than five (5) feet (1.5 m) below the grade elevation unless otherwise approved by the Owner.

4. If the torsional strength rating of the pier and/or installing unit has been reached prior to satisfying the minimum depth required, the installing contractor shall have the following options:
  - a. Terminate the installation at the depth obtained with the approval of the Owner, or,
  - b. Remove the existing pier and install a pier with smaller and/or fewer helices. This revised pier shall be terminated deeper than the terminating depth of the original pier as directed by the Owner.
5. In the event the minimum installation torque is not achieved at minimum depth, the Contractor shall install the foundation deeper using additional plain extension sections.
6. The minimum specified installation torque shall have been met when the measured installation torque meets or exceeds the minimum specified installation torque in two successive readings of the measuring device, unless otherwise specified by the Owner.
7. The installer shall keep a written installation record for each Helical Pier®. This record shall include the following information as a minimum:
  - a. Project name and location.
  - b. Name of authorized and certified dealer and installer.
  - c. Name of installers foreman or representative witnessing the installation.
  - d. Date of installation.
  - e. Location of Helical Pier®.
  - f. Description of lead section including number and diameter of helices and extensions used.
  - g. Overall depth of installation from a known reference point.
  - h. Installation torque at termination of pier.
  - i. Load transfer device

#### **PART 4 - MEASUREMENT AND PAYMENT**

- 4.1 Use the following unit price as designated on the Bid Schedule. If required and not listed in the Bid Schedule, the following Bid Items are to be considered incidental to other bid items.
  - A. Install Festival Tent Anchors w/Helical Piers & Access Box: Per Each. Includes all labor, materials, and equipment to install the helical piers and access boxes as detailed on the plans. No allowance for changes in length relative to that originally bid.
    1. Bid Schedule Payment Reference: SP7.4.1.A.1
    2. Bid Schedule Description: Install Festival Tent Anchors w/Helical Piers ...per Each (EA).

END OF SECTION

## **SP8 - PRESSURE IRRIGATION**

### **PART 1 – GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Pressure irrigation water transmission and distribution pipe and fitting materials, installation, and testing.
- B. Refer to Division 600 for gravity irrigation transmission and distribution pipe and accessories, installation, and testing.

#### **1.2 REFERENCES**

- A. ANSI/AWWA C 906: Polyethylene Pressure Pipe and Fittings
- B. ASTM D 2241: PVC Pressure-Rated Pipe
- C. ASTM D 2672: Joints for IPS PVC Pipe

#### **1.3 SUMMARY**

- A. This Section includes piping, valves, and specialties for pressurized water-supply system supplying quick couplers within the extents of the synthetic play field, and minor revisions to existing irrigation.

#### **1.4 DEFINITIONS**

- A. Circuit/Lateral Piping: Downstream from control valves to sprinklers, specialties, and drain valves. Piping is under pressure only during flow.
- B. Pressure/Mainline Piping: Downstream from point of connection to water distribution piping to, and including, control valves. Piping is under water-distribution-system pressure.
- C. Quick Couplers (QC): Supplemental watering station connected directly off mainline piping. May be under continual operation pressure from water distribution system.
- D. Point-of-Connection: Designated location of connection from water source to water distribution system.

#### **1.5 PERFORMANCE REQUIREMENTS**

- A. Irrigation zone control shall be automatic operation with battery powered automatic control valves.
- B. Minimum Working Pressures: The following are minimum pressure requirements for piping, valves, and specialties unless otherwise indicated:
  - 1. Irrigation Mainline Piping: 150 PSIG
  - 2. Lateral Piping: 200 PSIG
  - 3. Electric Valves: 150 PSIG
  - 4. Isolation Valves/Ball Valves: 150 PSIG

#### **1.6 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
  - 1. Automatic Control Valves
  - 2. Piping/Fittings/Clamps/Solvents
  - 3. Quick Couplers
  - 4. Isolation Valves
  - 5. Backflow Preventor

- 6. Valve Boxes
- 7. Controllers

#### 1.7 INFORMATIONAL SUBMITTALS

##### A. Qualification Data: For qualified Installer.

- 1. Provide evidence of the following:
  - a. Name of irrigation contractor.
  - b. Minimum of (5) five years of irrigation installation experience.
  - c. Project name, date completed and overall project budget of a minimum of (3) three similar projects completed within the last (5) five years.

#### 1.8 CLOSEOUT SUBMITTALS

##### A. Operation and Maintenance Data: For sprinklers, controller(s), quick couplers, and automatic control valves to include in operation and maintenance manuals.

##### B. As Built / Record Drawings:

- 1. Record accurately on one set of reproducible copies of the site plan all installed work including both pressure and non-pressure lines. Upon completion of each increment of work, transfer all such information and dimensions to the print. The dimensions shall be recorded in a legible manner.
- 2. Dimension from two permanent points of reference (buildings, monuments, sidewalks, curbs, pavement, etc.). Locations shown on as-built drawings shall be kept day-to-day as the project progresses in installation. All text size dimensions shall be minimum 1/8-inch height on drawings.
- 3. Show locations and depths of the following items:
  - a. Point of Connection (P.O.C.)
  - b. Routing of mainline/pressure piping and lateral piping (label horizontal and vertical dimensions every 100 LF along routing).
  - c. Control Valves
  - d. Quick Couplers
  - e. Other related equipment
- 4. Always maintain as-built drawings on-site.
- 5. Make all notes on drawings in pencil (no ink pen).
- 6. Contractor shall preserve a set of approved contract drawings on which is to be placed exact measured dimensions of line runs, tees, valves, sprinkler, and gate valve locations. This work must be completed daily.
- 7. Upon substantial completion of the project, the contractor shall submit the drawings to the Engineer for review and approval. Upon approval, the contractor shall prepare a set of as-built reproducible drawings on which all the information is clearly shown with drafting and legibility compared to original drawings. The owner's representative will be the sole judge of the acceptability of the drawings. The receipt and approval of these documents is a prerequisite to final payment.

#### 1.9 MAINTENANCE MATERIAL SUBMITTALS

##### A. Furnish Quick Coupler Keys: (5) units.

#### 1.10 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers with a minimum of (5) five years of installation experience and a minimum of (3) three demonstrated projects of similar scope, budget, and complexity.
- B. Backflow prevention assemblies and installation: Comply with requirements of Owner of Sandpoint and State of Idaho.

#### 1.11 DELIVERY, STORAGE, AND HANDLING

- A. It is the responsibility of the contractor to ensure the serviceability of all materials and products used or installed during the execution of contract. Any materials rendered unserviceable due to neglect in handling, storage, or transportation will be replaced at no cost to the Owner.
- B. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- C. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

#### 1.12 PROJECT CONDITIONS

- A. It is the responsibility of the irrigation contractor to conduct the following surveys to gather informational data prior to construction.
  - 1. Surveying: Perform site survey, research public utility records and verify utility locations prior to commencement of work.
  - 2. Logistical Information: Investigate and determine available water supply, minimum pressure, location and size of Point of Connection and available flow.
  - 3. Site Conditions: Investigate topography, soil conditions and other conditions as may affect project execution.

#### 1.13 SEQUENCING AND SCHEDULING:

- A. Construction Inspections: During the construction of the project an owner's representative shall make daily inspections of the project to take digital photos of all trenching, piping, and head placement PRIOR to any backfilling. This will also allow the contractor to discuss any minor concerns or issues regarding the layout of the system
- B. Post-Construction Meeting: Upon completion of project, a meeting will be scheduled between contractor and owner's representatives to discuss acceptance, generate a punch list, and demonstrate operation of the project.

## PART 2 – MATERIALS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified:
  - 1. Hunter Irrigation
  - 2. Rain Bird Irrigation

## 2.2 PIPES, TUBES, AND FITTINGS

- A. Comply with requirements in the piping schedule for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.
- B. Galvanized-Steel Pipe: ASTM A53/A53M, Standard Weight, Type E, Grade B.
  - 1. Galvanized-Steel Pipe Nipples: ASTM A733, made of ASTM A53/A53M or ASTM A106/A106M, Standard Weight, seamless-steel pipe with threaded ends.
  - 2. Galvanized, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.
  - 3. Malleable-Iron Unions: ASME B16.39, Class 150, hexagonal-stock body with ball-and-socket, metal-to-metal, bronze seating surface, and female threaded ends.
  - 4. Cast-Iron Flanges: ASME B16.1, Class 125.
- C. PVC Pipe: ASTM D1784, PVC 1120 compound, Type 1 Grade 1, Cell Class of 12454B. Schedule 40 PVC.
  - 1. All mainline pipe used to install irrigation systems on project shall be PVC (polyvinyl chloride plastic) Pipe and shall meet current minimum ASTM standards that apply to seamless PVC pressure rated piping. All piping installed in trenches shall not be stacked upon each other. There shall be a minimum of 4" horizontal separation between the pipes within the same trench. No other pipe material will be accepted unless specified by the landscape architect drawing or approved by designated representative.
    - a. PVC Socket Fittings: ASTM D2672, Schedules 40.
    - b. PVC Threaded Fittings: ASTM D2464, Schedule 80.
    - c. PVC Socket Unions: Schedule 80.
  - 2. Mainlines/Pressure Piping: Schedule 40 PVC Pipe, use solvent welds. All solvent welds will use a heavy bodied solvent and purple primer.
  - 3. Laterals/Circuit Piping: Schedule 40 PVC Pipe per plans. All solvent welds will use a heavy bodied solvent and purple primer.
- D. HDPE Pipe: ASTM D2239, AWWA C901, NSF Standards 14 and 61, High-Density Polyethylene, SDR 9 PE 4710 (IPS), Rated to 200 PSI.
  - 1. Laterals/Circuit piping: High-Density Polyethylene Pipe. All piping installed in trenches shall not be stacked upon each other. There shall be a minimum of 4" horizontal separation between the pipes within the same trench. No other pipe material will be accepted unless specified by the landscape architect drawing or approved by designated representative.
  - 2. Fittings:
    - a. Barbed/Insert fittings as manufactured by LASCO Fittings, Inc. or approved equal.
    - b. Clamps shall be stainless steel, worm gear hose clamps, sized to fit.

## 2.3 PIPING JOINING MATERIALS

- A. Solvent Cements for Joining PVC Piping: ASTM D2564. Include primer according to ASTM F656.

## 2.4 SLEEVING

- A. PVC Pipe, Pressure Rated: ASTM D2241, PVC 1120 compound, Class 200 SDR 21
1. All transitions of piping under hardscape including concrete, asphalt or other materials used for walkways, patios, common areas or roads shall be encased in Class 200 PVC sleeves. Sleeves shall be a minimum of (4") inches or 2x times the diameter of the encased pipe, whichever is greater.
  2. Each end shall be sealed with duct tape to prevent dirt and debris from sloughing into the body of the sleeve.
  3. Sleeves will extend to a minimum of (18") inches past hardscape edges being traversed and will have a depth of not less than (36") inches below grade and no greater than (36") inches.
  4. Sleeves shall be located per drawings.
  5. Only one irrigation pipe (i.e. mainline or lateral line) is allowed per sleeve.
- 2.5 ISOLATION VALVES
- A. All isolation valves shall be brass bodied gate valves of the same size as the attached mainline or larger manufactured by the following:
1. Nibco
  2. Milwaukee
  3. McDonald
  4. Approved Equal
- B. Valves shall be located as indicated on Drawings.
- 2.6 AUTOMATIC CONTROL VALVES
- A. Description: Molded-Plastic body, normally closed, diaphragm type with manual-flow adjustment, and operated by 24V AC solenoid.
1. All electric control valves shall be Rain Bird PEB or Hunter ICV type valves.
    - a. Size and locations as indicated on Drawings.
- 2.7 QUICK COUPLERS
- A. Description: Factory-fabricated, brass, two-piece assembly, rubber-covered cap, and operating key.
1. All quick couplers shall be Rain Bird 44-RC.
    - a. Locations as indicated on Drawings.
- 2.8 BACKFLOW PREVENTER
- A. Description: Factory-fabricated Reduced Pressure Principle Assembly with full port quarter turn ball valves.
1. Backflow Preventer shall be ASSE Listed 1013, rated to 108°F degrees Fahrenheit, and supplied with full port ball valves. The main body and access covers shall be bronze (ASTM B 584), the seat ring and all internal polymers shall be NSF Listed Noryl™ and the seat disc elastomers shall be silicone. The first and second checks shall be accessible for maintenance without removing the relief valve or the entire device from the line. If installed indoors, the installation shall be supplied with an air gap adapter and integral monitor switch.

- a. Reduced Pressure Principle Backflow Preventer shall be a Zurn Wilkins Model# 975XL
  - b. Size shall be (2-inch).
  - c. Manufactured by Zurn Industries, LLC.
  - d. Locations as indicated on Drawings.
2. Backflow Preventer Security Cage:
- a. Cages shall be "Gorilla Cages" manufactured by Houston Irrigation Services, (281) 705-9701 ([www.GorillaCages.com](http://www.GorillaCages.com)).
    - i. Size shall be confirmed by Contractor (submit cage size to Architect for approval).
    - ii. Cage shall be powder coated.
    - iii. Color shall be Dark Green (submit color sample to Engineer for approval).

## 2.9 VALVE BOXES

- A. Boxes in Natural Landscape Conditions:
- 1. All irrigation boxes as manufactured by Carson or approved equal.
  - 2. Description: Box and cover, with open bottom and openings for piping; designed for installing flush with grade.
    - a. Size: 14" x 19"
    - b. Shape: Rectangular
    - c. Sidewall Material: HDPE, Flared
    - d. Cover Material: HDPE
      - i. Lettering: "IRRIGATION VALVE BOX"
      - ii. Color shall be green
    - e. Extensions: As required, 14" x 19" x 6"
- B. Boxes in Synthetic Turf Conditions:
- 1. TCITQCV - TurfCool™ Quick Coupler or Gate Valve Box for synthetic infill turf as manufactured and supplied by:
  - 2. Sportsfield Specialties, Inc. P.O. Box 231, 41155 State Highway 10, Delhi, NY 13753. 888-975-3343 ([www.sportsfieldspecialties.com](http://www.sportsfieldspecialties.com)).
    - a. TCITQCV - TurfCool® Quick Coupler or Gate Valve Box for Synthetic Infill Turf
      - i. Dimensions: 18" W x 15"L x (length as required – field verify)
    - b. Box: 3/16" (0.1875") Aluminum Construction, Welded Frame with Open Bottom Having the Following Attributes:
      - i. 1/8" (0.125") Aluminum Cover Ledge
      - ii. Integrated Synthetic Infill Turf Attachment Ledge
      - iii. Infill Retainer System with 1-1/4" (1.25") Flexible Gasket Seals Specifically Designed for Synthetic Infill Turf Applications
      - iv. 2" O.D. Pipe Clamps and Mounting Brackets
      - v. 1" PVC Drain Stub for Positive Drainage Connection
      - vi. Leveling Bolts
    - c. Solid Cover: 1/8" (0.125") Aluminum Construction with the Following Attributes:



- i. Infill Retainer System with 1-1/4" (1.25") Flexible Gasket Seals Specifically Designed for Synthetic Infill Turf Applications
      - ii. Designed to Allow Synthetic Turf Material to be Adhered Directly to the Aluminum Surface with Appropriate Adhesive and/or Mechanical Fasteners.
    - d. Assembly Hardware
  - C. Drainage Backfill: Clean, crushed aggregate, graded from 5/8" minimum to 3/4" maximum.
- 2.10 AUTOMATIC CONTROL SYSTEM
  - A. Description: Battery-operated controller.
    - 1. As manufactured by Rain Bird:
      - a. Controller shall be Rain Bird ESP-9V.
  - B. Wiring: UL 493, Type UF multiconductor, with solid-copper conductors; insulated cable; suitable for direct burial.
    - 1. Low-Voltage, Branch-Circuit Cables: No. 14 AWG minimum, between controllers and automatic control valves; color-coded different from feeder-circuit-cable jacket color; with jackets of different colors for multiple-cable installation in same trench.
    - 2. Splicing Materials: Manufacturer's packaged kit consisting of insulating, spring-type connector or crimped joint and epoxy resin moisture seal; suitable for direct burial.
- 2.11 DRAIN VALVE
  - A. Automatic Drain Valve: Rain Bird filtered drain valve, 2 stage cleaning, 1/2-inch MPT connection. Place at low point at 2 locations of 2" quick couple valve loop line. Low points to occur above 18" perforated pipe field drain.

## **PART 3 – WORKMANSHIP**

### **3.1 EARTHWORK**

- A. Excavating, trenching, and backfilling are specified in Section 202 "Excavation and Embankment", Section 301 "Trench Excavation", Section 305 "Pipe Bedding", and Section 306 "Trench Backfill".
- B. Provide minimum cover over top of underground piping according to the following:
  - 1. Irrigation Mainline Piping: 36-inches (762 mm) below finished grade.
  - 2. Circuit/Lateral Piping: 36-inches (762 mm) below finished grade.
  - 3. Sleeves: 36-inches (762 mm) below finished grade.

### **3.2 PREPARATION**

- A. Set stakes to identify locations of proposed irrigation system.

### **3.3 PIPING INSTALLATION**

- A. Location and Arrangement: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are approved by Engineer.
- B. Install piping at minimum uniform slope of 0.5 percent down toward drain valves.
- C. Install piping free of sags and bends.

- D. Install groups of pipes parallel to each other, spaced to permit valve servicing (minimum 4-inches in all directions).
- E. Install fittings for changes in direction and branch connections.
- F. Install unions adjacent to valves and to final connections to other components with NPS 2 (DN 50) or smaller pipe connection.
- G. Install underground thermoplastic piping according to ASTM D2774 [and ASTM F690].
- H. Lay piping on solid subbase, uniformly sloped without humps or depressions.
- I. Install PVC piping in dry weather when temperature is above 40 deg F (5 deg C). Allow joints to cure at least 24 hours at temperatures above 40 deg F (5 deg C) before testing.
- J. Install piping in sleeves under parking lots, roadways, and sidewalks.
- K. Install sleeves per products Section 2.4, PVC pipe and socket fittings, and solvent-cemented joints.
- L. Install transition fittings for plastic-to-metal pipe connections according to the following:
  - 1. Underground Piping:
    - a. NPS 1-1/2 (DN 40) and Smaller: Plastic-to-metal transition fittings.
    - b. NPS 2 (DN 50) and Larger: AWWA transition couplings.
  - 2. Aboveground Piping:
    - a. NPS 2 (DN 50) and Smaller: Plastic-to-metal transition [fittings] [unions].
- M. Install dielectric fittings for dissimilar-metal pipe connections according to the following:
  - 1. Underground Piping:
    - a. NPS 2 (DN 50) and Smaller: Dielectric coupling or dielectric nipple.
  - 2. Aboveground Piping:
    - a. NPS 2 (DN 50) and Smaller: Dielectric union.

### 3.4 JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
  - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
  - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- D. PE Piping Fastener Joints: Join with insert fittings and bands or fasteners according to piping manufacturer's written instructions.
- E. PVC Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
  - 1. Comply with ASTM F402 for safe-handling practice of cleaners, primers, and solvent cements.

2. PVC Pressure Piping: Join schedule number, ASTM D1785, PVC pipe and PVC socket fittings according to ASTM D2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D2855.
3. PVC Non-pressure Piping: Join according to ASTM D2855.

### 3.5 VALVE INSTALLATION

- A. Underground Gate Valves: Install in valve boxes defined in Section 2.9.
- B. Underground Automatic Control Valves: Install in valve boxes defined in Section 2.9.

### 3.6 AUTOMATIC IRRIGATION-CONTROL SYSTEM INSTALLATION

- A. Equipment Mounting: Install battery-operated controller(s) inside automatic control valve box adjacent to control valve.
- B. Install control cable in same trench as irrigation piping and at least 2 inches (51 mm) beside piping. Provide conductors of size not smaller than recommended by controller manufacturer. Install cable in separate Schedule 40 Grey Conduit sleeve under paved areas (minimum pipe size 2-inch).

### 3.7 CONNECTION

- A. Comply with requirements of Owner for water supply from exterior water service piping, water meters, protective enclosures, and backflow preventers. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment, valves, and devices to allow service and maintenance.

### 3.8 FIELD QUALITY CONTROL

- A. Tests and Inspections:
  1. Pressure Test: After installation, fully charge system with water and test for leaks. Repair leaks and retest until no leaks exist.
    - a. Testing shall consist of the following:
      - i. Testing of mainline shall be performed when all connections and valves are in place.
        - A. Mainline Pressure shall be brought to static pressure of 100 PSI for 1-hour with not more than 3 PSI loss within the 1-hour time period.
  2. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
  3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- B. Any irrigation product will be considered defective if it does not pass tests and inspections.

### 3.9 STARTUP SERVICE

- A. Perform startup service.
  1. Complete installation and startup check according to manufacturer's written instructions.

2. Verify that controllers are installed and connected according to the Contract Documents.
3. Verify that electrical wiring installation complies with manufacturer's submittal.

### 3.10 ADJUSTING

- A. Adjust settings of controllers.
- B. Adjust automatic control valves to provide flow rate at rated operating pressure required for each sprinkler circuit.
- C. Adjust sprinklers and devices, except those intended to be mounted aboveground, so they will be flush with finish grade.

### 3.11 CLEANING

- A. Flush dirt and debris from piping before installing sprinklers and other devices.

### 3.12 DEMONSTRATION

- A. Irrigation Contractor shall train Owner's maintenance personnel to adjust, operate, and maintain automatic control valves and controllers.

## PART 4 – MEASUREMENT AND PAYMENT

### 4.1 SECTION INCLUDES

- A. Install (2-Inch) Irrigation System Point-of-Connection (P.O.C.) - Includes all labor, materials, and equipment to install backflow preventer, gate valve, and quick coupler per plans. Connect into existing (2-Inch) water meter. Includes layout, trenching, pipe, fittings, connections, testing, boxes, security cages, vaults, slabs, backfill, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per lump sum.
  1. Bid Schedule Payment Reference: SP8.4.1.A
  2. Bid Schedule Description: Install (2-Inch) Irrigation System Point-of-Connection (P.O.C.)

### 4.2 SECTION INCLUDES

- A. Install (2-Inch) Irrigation Mainline - Includes all labor, materials, and equipment to install pressurized irrigation mainline. Includes layout, trenching, pipe, fittings, connections, testing, backfill, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per linear foot.
  1. Bid Schedule Payment Reference: SP8.4.2.A
  2. Bid Schedule Description: Install (2-Inch) Irrigation Mainline

### 4.3 SECTION INCLUDES

- A. Install (6-Inch) PVC Irrigation Sleeve - Includes all labor, materials, and equipment to install PVC Irrigation Sleeve. Includes layout, trenching, pipe, fittings, connections, testing, backfill, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per linear foot.
  1. Bid Schedule Payment Reference: SP8.4.3.A

2. Bid Schedule Description: Install (6-Inch) PVC Irrigation Sleeve

4.4 SECTION INCLUDES

- A. Install Quick Coupler w/ Turf Box - Includes all labor, materials, and equipment to install quick coupler and turf box. Includes survey, layout, excavation, box setting, pipe, fittings, connections, testing, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per each.
  - 1. Bid Schedule Payment Reference: SP8.4.4.A
  - 2. Bid Schedule Description: Install Quick Coupler w/ Turf Box

4.5 SECTION INCLUDES

- A. Install Isolation Valve w/ Turf Box – Includes all labor, materials, and equipment to install isolation valve and turf box. Includes survey, layout, excavation, box setting, pipe, fittings, connections, testing, PVC valve access extension pipe, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per each.
  - 1. Bid Schedule Payment Reference: SP8.4.5.A
  - 2. Bid Schedule Description: Install Isolation Valve w/ Turf Box

4.6 SECTION INCLUDES

- A. Re-Connect Existing Irrigation Circuit Piping – Includes all labor, materials, and equipment to re-connect existing irrigation lateral zone piping along the North East corner of the site to new water source. Includes all scope from newly installed PVC tee after point-of-connection, battery-operated controller and automatic control valve, valve box, PVC circuit piping, vertical PVC sleeves through cement treated base (CTB), and transition fittings from new PVC laterals to existing polyethylene pipe. Includes layout, trenching, pipe, fittings, connections, testing, backfill, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per lump sum.
  - 1. Bid Schedule Payment Reference: SP8.4.6.A
  - 2. Bid Schedule Description: Re-Connect Existing Irrigation Circuit Piping

END OF SECTION

## **SP9 Electrical Utility Relocation**

### **PART 1 – GENERAL**

#### **1.1 SECTION INCLUDES**

- A. This work consists of all components required to provide the trenching, conduit, hand holes to relocate the existing Avista utility primary lines.

#### **1.2 RELATED SECTION**

- A. Section SP15 – Common Works Results
- B. Section SP19 – Raceways and Boxes

#### **1.3 REGULATIONS**

- A. Codes and Ordinances: Comply with all applicable codes, ordinances and regulations including the National Electrical Code, NFPA, and all other national, state and local codes and ordinances. Notify the Engineer of any non-compliance in contract documents to applicable codes and regulations prior to installation of the work. Changes in the work after initial installation due to requirements of code enforcing agencies shall be at no additional cost to the Owner.
- B. Permits: Provide and pay for all permits required for this project. In addition to paying for all permits, the Contractor shall be responsible for contacting the various Approving Authorities, arranging for review of shop drawings where appropriate, scheduling inspections in a timely manner, and making necessary corrections as required by the Approving Authorities.
- C. Approving Authority: It is the Contractor's responsibility to ascertain and contact the appropriate "Approving Authorities" for this project. Approving Authorities will include, but not be limited to the electrical inspector and the Fire Marshal having jurisdiction.
- D. Certificate of Inspection: Obtain a Certificate of Electrical Inspection from the local inspecting authority indicating final acceptance.
- E. Safety Measures to be Taken: The Engineer has not been retained or compensated to provide design and construction review services relating to the Contractor's safety precautions or to means, methods, techniques, sequences or procedures required for the Contractor to perform his work. The Contractor will be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours. The duty of the Engineer to conduct construction observations of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.

**PART 2 – NOT USED**

**PART 3 – NOT USED**

**PART 4 – MEASUREMENT AND PAYMENT**

**GENERAL CONDITIONS**

- A. General electrical conditions per lump sum. Includes furnishing all materials, equipment, labor, supervision, tools and items necessary for the construction, installation, connection, testing and operation of all electrical work for this project as shown on the Electrical Drawings specified herein. Includes where other divisions require electrical materials or installations comply with all applicable requirements herein to provide all electrical materials and installation work required to connect, test and operate equipment required by other divisions. Electrical installations required by other divisions but not shown on the electrical drawings shall be provided.
  - 1. Bid Schedule Payment Reference: SP09.4.1.A.1
  - 2. Bid Schedule Description:
    - a. Electrical Utility Relocation, Conduit, Trenching, & Fees

## **SP10 Field Lighting In ground Installation**

### **PART 1 – GENERAL**

#### **1.1 SECTION INCLUDES**

- A. This work consists of all components required to provide the trenching, conduit, wires, hand holes to connect the field lighting poles and field lights to the new Musco control panel. Replace existing Musco control panel with the new Musco Control Panel and Replacement of existing circuit breakers with new in panel FL.

#### **1.2 RELATED SECTION**

- A. Section SP15 – Common Works Results
- B. Section SP16 – Low voltage Electrical Power Conductor and Cables
- C. Section SP19 – Raceways and Boxes
- D. Section SP21 – Panelboards
- E. Section SP23 – Enclosed Switches and Circuit Breakers
- F. Section SP14 – Field Sports Lighting
- G. Section SP24 – LAN – Data – Telephone.

#### **1.3 REGULATIONS**

- A. Codes and Ordinances: Comply with all applicable codes, ordinances and regulations including the National Electrical Code, NFPA, and all other national, state and local codes and ordinances. Notify the Engineer of any non-compliance in contract documents to applicable codes and regulations prior to installation of the work. Changes in the work after initial installation due to requirements of code enforcing agencies shall be at no additional cost to the Owner.
- B. Permits: Provide and pay for all permits and fees required for this project. In addition to paying for all permits and fees, the Contractor shall be responsible for contacting the various Approving Authorities, arranging for review of shop drawings where appropriate, scheduling inspections in a timely manner, and making necessary corrections as required by the Approving Authorities.
- C. Approving Authority: It is the Contractor's responsibility to ascertain and contact the appropriate "Approving Authorities" for this project. Approving Authorities will include, but not be limited to the electrical inspector and the Fire Marshal having jurisdiction.
- D. Certificate of Inspection: Obtain a Certificate of Electrical Inspection from the local inspecting authority indicating final acceptance.



- E. Safety Measures to be Taken: The Engineer has not been retained or compensated to provide design and construction review services relating to the Contractor's safety precautions or to means, methods, techniques, sequences or procedures required for the Contractor to perform his work. The Contractor will be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours. The duty of the Engineer to conduct construction observations of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.

**PART 2 – NOT USED**

**PART 3 – NOT USED**

**PART 4 – MEASUREMENT AND PAYMENT**

**GENERAL CONDITIONS**

- A. General electrical conditions per lump sum. Includes furnishing all materials, equipment, labor, supervision, tools and items necessary for the construction, installation, connection, testing and operation of all electrical work for this project as shown on the Electrical Drawings specified herein. Includes where other divisions require electrical materials or installations comply with all applicable requirements herein to provide all electrical materials and installation work required to connect, test and operate equipment required by other divisions. Electrical installations required by other divisions but not shown on the electrical drawings shall be provided.
1. Bid Schedule Payment Reference: SP10.4.1.A.1
  2. Bid Schedule Description:
    - a. Field Lighting Ground Installation

## **SP11 Baseball Field Improvements**

### **PART 1 – GENERAL**

#### **1.1 SECTION INCLUDES**

- A. This work consists of all components required to provide the trenching, conduit, wires, hand holes, panelboards, wiring devices and enclosures to install all electrical device around the perimeter of the field turf.

#### **1.2 RELATED SECTION**

- A. Section SP15 – Common Works Results
- B. Section SP16 – Low voltage Electrical Power Conductor and Cables
- C. Section SP17 – Grounding and Bonding
- D. Section SP19 – Raceways and Boxes
- E. Section SP20 – Identification
- F. Section SP21 – Panelboards
- G. Section SP22 – Wiring Devices
- H. Section SP23 – Enclosed Switches and Circuit Breakers
- I. Section SP14 – Field Sports Lighting
- J. Section SP24 – LAN – Data – Telephone.

#### **1.3 REGULATIONS**

- A. Codes and Ordinances: Comply with all applicable codes, ordinances and regulations including the National Electrical Code, NFPA, and all other national, state and local codes and ordinances. Notify the Engineer of any non-compliance in contract documents to applicable codes and regulations prior to installation of the work. Changes in the work after initial installation due to requirements of code enforcing agencies shall be at no additional cost to the Owner.
- B. Permits: Provide and pay for all permits and fees required for this project. In addition to paying for all permits and fees, the Contractor shall be responsible for contacting the various Approving Authorities, arranging for review of shop drawings where appropriate, scheduling inspections in a timely manner, and making necessary corrections as required by the Approving Authorities.
- C. Approving Authority: It is the Contractor's responsibility to ascertain and contact the appropriate "Approving Authorities" for this project. Approving Authorities will include, but not be limited to the electrical inspector and the Fire Marshal having jurisdiction.

- D. Certificate of Inspection: Obtain a Certificate of Electrical Inspection from the local inspecting authority indicating final acceptance.
- E. Safety Measures to be Taken: The Engineer has not been retained or compensated to provide design and construction review services relating to the Contractor's safety precautions or to means, methods, techniques, sequences or procedures required for the Contractor to perform his work. The Contractor will be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours. The duty of the Engineer to conduct construction observations of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.

## **PART 2 – NOT USED**

## **PART 3 – NOT USED**

## **PART 4 – MEASUREMENT AND PAYMENT**

### **GENERAL CONDITIONS**

- A. General electrical conditions per lump sum. Includes furnishing all materials, equipment, labor, supervision, tools and items necessary for the construction, installation, connection, testing and operation of all electrical work for this project as shown on the Electrical Drawings specified herein. Includes where other divisions require electrical materials or installations comply with all applicable requirements herein to provide all electrical materials and installation work required to connect, test and operate equipment required by other divisions. Electrical installations required by other divisions but not shown on the electrical drawings shall be provided.
  - 1. Bid Schedule Payment Reference: SP11.4.1.A.1
  - 2. Bid Schedule Description:
    - a. Baseball Field Improvements

## **SP12 Phase II Electrical Preparation**

### **PART 1 – GENERAL**

#### **1.1 SECTION INCLUDES**

- A. This work consists of all components required to provide the trenching, conduit, hand holes for future pathways to serve the phase II areas parking lot lights and restroom facility.

#### **1.2 RELATED SECTION**

- A. Section SP15 – Common Works Results
- B. Section SP19 – Raceways and Boxes

#### **1.3 REGULATIONS**

- A. Codes and Ordinances: Comply with all applicable codes, ordinances and regulations including the National Electrical Code, NFPA, and all other national, state and local codes and ordinances. Notify the Engineer of any non-compliance in contract documents to applicable codes and regulations prior to installation of the work. Changes in the work after initial installation due to requirements of code enforcing agencies shall be at no additional cost to the Owner.
- B. Permits: Provide and pay for all permits and fees required for this project. In addition to paying for all permits and fees, the Contractor shall be responsible for contacting the various Approving Authorities, arranging for review of shop drawings where appropriate, scheduling inspections in a timely manner, and making necessary corrections as required by the Approving Authorities.
- C. Approving Authority: It is the Contractor's responsibility to ascertain and contact the appropriate "Approving Authorities" for this project. Approving Authorities will include, but not be limited to the electrical inspector and the Fire Marshal having jurisdiction.
- D. Certificate of Inspection: Obtain a Certificate of Electrical Inspection from the local inspecting authority indicating final acceptance.
- E. Safety Measures to be Taken: The Engineer has not been retained or compensated to provide design and construction review services relating to the Contractor's safety precautions or to means, methods, techniques, sequences or procedures required for the Contractor to perform his work. The Contractor will be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours. The duty of the Engineer to conduct construction observations of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.

**PART 2 – NOT USED**

**PART 3 – NOT USED**

**PART 4 – MEASUREMENT AND PAYMENT**

**GENERAL CONDITIONS**

- A. General electrical conditions per lump sum. Includes furnishing all materials, equipment, labor, supervision, tools and items necessary for the construction, installation, connection, testing and operation of all electrical work for this project as shown on the Electrical Drawings specified herein. Includes where other divisions require electrical materials or installations comply with all applicable requirements herein to provide all electrical materials and installation work required to connect, test and operate equipment required by other divisions. Electrical installations required by other divisions but not shown on the electrical drawings shall be provided.
  - 1. Bid Schedule Payment Reference: SP12.4.1.A.1
  - 2. Bid Schedule Description:
    - a. Phase II Electrical Preparation

## **SP13 Cabling For Osprey Camera**

### **PART 1 – GENERAL**

#### **1.1 SECTION INCLUDES**

- A. This work consists of all components required to provide the trenching, conduit, wires, hand holes, Data Rack and power to new Osprey Camera Location. Communication Cabling will be by others

#### **1.2 RELATED SECTION**

- A. Section SP15 – Common Works Results
- B. Section SP19 – Raceways and Boxes
- C. Section SP24 – LAN – Data – Telephone.

#### **1.3 REGULATIONS**

- A. Codes and Ordinances: Comply with all applicable codes, ordinances and regulations including the National Electrical Code, NFPA, and all other national, state and local codes and ordinances. Notify the Engineer of any non-compliance in contract documents to applicable codes and regulations prior to installation of the work. Changes in the work after initial installation due to requirements of code enforcing agencies shall be at no additional cost to the Owner.
- B. Permits: Provide and pay for all permits and fees required for this project. In addition to paying for all permits and fees, the Contractor shall be responsible for contacting the various Approving Authorities, arranging for review of shop drawings where appropriate, scheduling inspections in a timely manner, and making necessary corrections as required by the Approving Authorities.
- C. Approving Authority: It is the Contractor's responsibility to ascertain and contact the appropriate "Approving Authorities" for this project. Approving Authorities will include, but not be limited to the electrical inspector and the Fire Marshal having jurisdiction.
- D. Certificate of Inspection: Obtain a Certificate of Electrical Inspection from the local inspecting authority indicating final acceptance.
- E. Safety Measures to be Taken: The Engineer has not been retained or compensated to provide design and construction review services relating to the Contractor's safety precautions or to means, methods, techniques, sequences or procedures required for the Contractor to perform his work. The Contractor will be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours. The duty of the Engineer to conduct construction

observations of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.

**PART 2 – NOT USED**

**PART 3 – NOT USED**

**PART 4 – MEASUREMENT AND PAYMENT**

**GENERAL CONDITIONS**

- A. General electrical conditions per lump sum. Includes furnishing all materials, equipment, labor, supervision, tools and items necessary for the construction, installation, connection, testing and operation of all electrical work for this project as shown on the Electrical Drawings specified herein. Includes where other divisions require electrical materials or installations comply with all applicable requirements herein to provide all electrical materials and installation work required to connect, test and operate equipment required by other divisions. Electrical installations required by other divisions but not shown on the electrical drawings shall be provided.
  - 1. Bid Schedule Payment Reference: SP13.4.1.A.1
  - 2. Bid Schedule Description:
    - a. Cable for Osprey Camera

## **SP14 Field Sports Lighting**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and General Provisions of contract, including General and Supplementary Conditions.
- B. SP15 Common Work Results
- C. SP16 Low-Voltage Electrical Power Conductors & Cables
- D. SP17 Grounding and Bonding
- E. SP19 Raceways and Boxes

#### **1.2 BASE AND ALTERNATE SYSTEMS**

- A. The Basis-of Design sports lighting system shall be Musco Lighting. The drawings and specifications indicate locations and materials required for a Musco Lighting new/retrofit installation. This specification describes the requirements for providing a complete sports lighting system to illuminate the area indicated on the drawings and shall include all components for control and power distribution in the base bid.
- B. Approved base bid, basis-of-design system manufacturer and representative:
  - 1. Musco Lighting (208) 616-3258; Contact – Creighton Fuss

#### **1.3 PRE-BID APPROVAL**

- A. Design Approval: The owner / engineer will review pre-bid submittals from other manufacturers to ensure compliance to the specification 15 days prior to bid. If the design meets the design requirements of the specifications, a letter and/or addendum will be issued to the manufacturer indicating approval for the specific design submitted.
- B. Approved Product: Musco's Light-Structure System™ with TLC for LED™ is the approved product. All substitutions must provide a complete submittal package for approval as outlined in Submittal Information at least 15 days prior to bid. Special manufacturing to meet the standards of this specification may be required. An addendum will be issued prior to bid listing any other approved lighting manufacturers and designs.
- C. All manufacturers not pre-approved shall submit the information at the end of this section at least 10 days prior to bid. An addendum will be issued prior to bid; listing approved lighting manufacturers and the design method to be used.
- D. Bidders are required to bid only products that have been approved by this specification or addendum by the owner or owner's representative. Bids received that do not utilize an approved system/design, will be rejected.



#### 1.4 SUMMARY

- A. Work covered by this section of the specifications shall conform to the contract documents, engineering plans as well as state and local codes.
- B. The purpose of this specification is to define the lighting system performance and design standards for the playing field using an LED Lighting source. The manufacturer / contractor shall supply lighting equipment to meet or exceed the standards set forth in these specifications.
- C. The primary goals of this sports lighting project are:
  - 1. Guaranteed Light Levels: Selection of appropriate light levels impact the safety of the players and the enjoyment of spectators. Therefore, light levels are guaranteed to not drop below specified target values for a period of 25 years.
  - 2. Environmental Light Control: It is the primary goal of this project to minimize spill light to adjoining properties and glare to the players, spectators and neighbors. The LED design should provide better control than a good HID design.
  - 3. Life-cycle Cost: In order to reduce the operating budget, the preferred lighting system shall be energy efficient and cost effective to operate. All maintenance costs shall be eliminated for the duration of the warranty.
  - 4. Control and Monitoring: To allow for optimized use of labor resources and avoid unneeded operation of the facility, customer requires a remote on/off control system for the lighting system. Fields should be proactively monitored to detect luminaire outages over a 25-year life cycle. All communication and monitoring costs for 25-year period shall be included in the bid.
- D. All lighting designs shall comply with IBC 2015 110MPH, Exposure C.

#### 1.5 LIGHTING PERFORMANCE

- A. Illumination levels and design factors: playing surfaces shall be lit to an average target illumination level and uniformity as specified in the chart below. Lighting calculations shall be developed and field measurements taken on the grid spacing with the minimum number of grid points specified below. Appropriate light loss factors shall be applied and submitted for the basis of design. Average illumination level shall be measured in accordance with the iesna lm-5-04 (iesna guide for photometric measurements of area and sports lighting installations). Illumination levels shall not to drop below desired target values in accordance to ies rp-6-15, page 2, maintained average illuminance and shall be guaranteed for the full warranty period.

Area of Lighting	Average Target Illumination Levels	Maximum to Minimum Uniformity Ratio	Grid Points	Grid Spacing
Football	30	1.5:1.0	72	30' x 30'
Soccer	30	1.5:1.0	72	30' x 30'
Baseball and Softball Infield	50	1.5:1.0	72	30' x 30'
Baseball Outfield	30	1.5:1.0	72	30' x 30'

- B. Color: the lighting system shall have a minimum color temperature of 5700k and a cri of 75.
- C. Mounting heights: to ensure proper aiming angles for reduced glare and to provide better playability, minimum mounting heights shall be as described below. Higher mounting heights may be required based on photometric report and ability to ensure the top of the field angle is a minimum of 10 degrees below horizontal.
- D. Pole A3 is the only new pole, rest are existing.
- E. Poles A3, A1 and B1 need new pole bases.

# of Poles	Pole Designation	Pole Height
2	A1,A2	70'
3	A3,B1,B2	90'
2	F1,F2	80'

#### 1.6 ENVIRONMENTAL LIGHT CONTROL

- A. Light Control Luminaires: All luminaires shall utilize spill light and glare control devices including, but not limited to, internal shields, louvers and external shields. No symmetrical beam patterns are accepted.
- B. Glare Control: Maximum candela at a distance of 150' should be better than that of a comparable HID design. These values are defined for typical sports fields listed below.

Typical Field Type	Maximum Candela at 150'
Multi Uses Play Field	<24,000 candela

#### 1.7 LIFE-CYCLE COSTS

- A. Manufacturer shall submit a 25-year life cycle cost calculation as outlined in the required submittal information.
- B. Preventative and Spot Maintenance: Manufacturer shall provide all preventative and spot maintenance, including parts and labor for 25 years from the date of equipment shipment. Individual outages shall be repaired when the usage of any field is materially impacted. Owner agrees to check fuses in the event of a luminaire outage.

## PART 2 - PRODUCT

### 2.1 SPORTS LIGHTING SYSTEM CONSTRUCTION

- A. Manufacturing Requirements: All components shall be designed and manufactured as a system. All luminaires, wire harnesses, drivers and other enclosures shall be factory assembled, aimed, wired and tested.
- B. Durability: All exposed components shall be constructed of corrosion resistant material and/or coated to help prevent corrosion. All exposed carbon steel shall be hot dip galvanized per ASTM A123. All exposed aluminum shall be powder coated with high performance polyester or anodized. All exterior reflective inserts shall be anodized, coated, and protected from direct environmental exposure to prevent reflective degradation or corrosion. All exposed hardware and fasteners shall be stainless steel of 18-8 grade or better, passivated and coated with aluminum-based thermosetting epoxy resin for protection against corrosion and stress corrosion cracking. Structural fasteners may be carbon steel and galvanized meeting ASTM A153 and ISO/EN 1461 (for hot dipped galvanizing), or ASTM B695 (for mechanical galvanizing). All wiring shall be enclosed within the cross-arms, pole, or electrical components enclosure.
- C. System Description: Lighting system shall consist of the following:
  - 1. Galvanized steel poles and cross-arm assembly. Poles shall have climbing steps, safety cable, and a maintenance platform at the top.
  - 2. Non-approved pole technology:
    - a. Square static cast concrete poles will not be accepted
    - b. Direct bury steel poles which utilize the extended portion of the steel shaft for their foundation will not be accepted due to potential for internal and external corrosive reaction to the soils and long term performance concerns
  - 3. Lighting systems shall use concrete foundations. See Section 2.3 for details.
    - a. For a foundation using a pre-stressed concrete base embedded in concrete backfill the concrete shall be air-entrained and have a minimum compressive design strength at 28 days of 3,000 PSI. 3,000 PSI concrete specified for early pole erection, actual required minimum allowable concrete strength is 1,000 PSI. All piers and concrete backfill must bear on and against firm undisturbed soil.
    - b. For anchor bolt foundations or foundations using a pre-stressed concrete base in a suspended pier or re-enforced pier design pole erection may occur after 7 days. Or after

a concrete sample from the same batch achieves a certain strength.

4. Manufacturer will supply all drivers and supporting electrical equipment
  - a. Remote drivers and supporting electrical equipment shall be mounted approximately 10 feet above grade in aluminum enclosures. The enclosures shall be touch-safe and include drivers and fusing with indicator lights on fuses to notify when a fuse is to be replaced for each luminaire. Disconnect per circuit for each pole structure will be located in the enclosure.
5. Manufacturer shall provide surge protection at the pole equal to or greater than 40 kA for each line to ground (Common Mode) as recommended by IEEE C62.41.2\_2002.
6. Wire harness complete with an abrasion protection sleeve, strain relief and plug-in connections for fast, trouble-free installation.
7. All luminaires, visors, and cross-arm assemblies shall withstand 150 mph winds and maintain luminaire aiming alignment.
8. Control cabinet to provide remote on-off control and monitoring of the lighting system. See Section 2.4 for further details.
9. Manufacturer shall provide lightning grounding as defined by NFPA 780 and be UL Listed per UL 96 and UL 96A.
  - a. Integrated grounding via concrete encased electrode grounding system.
  - b. If grounding is not integrated into the structure, the manufacturer shall supply grounding electrodes, copper down conductors, and exothermic weld kits. Electrodes and conductors shall be sized as required by NFPA 780. The grounding electrode shall be minimum size of 5/8 inch diameter and 8 feet long, with a minimum of 10 feet embedment. Grounding electrode shall be connected to the structure by a grounding electrode conductor with a minimum size of 2 AWG for poles with 75 feet mounting height or less, and 2/0 AWG for poles with more than 75 feet mounting height.

D. Safety: All system components shall be UL listed for the appropriate application.

## 2.2 ELECTRICAL

A. Electric Power Requirements for the Sports Lighting Equipment:

1. Distribution electrical power: 480Y/277V, 3 phase, 4 wire
2. Fixture electric power: 480 Volt, 3 Phase
3. Control Voltage: 120V
4. Maximum total voltage drop: Voltage drop to the disconnect switch located on the poles shall not exceed three (3) percent of the rated voltage.

## 2.3 STRUCTURAL PARAMETERS

- A. Wind Loads: Wind loads shall be based on the 2015 International Building Code. Wind loads to be calculated using ASCE 7-10, an ultimate design wind speed of 115 and exposure category C.
- B. Pole Structural Design: The stress analysis and safety factor of the poles shall conform to 2013 AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals (LTS-6).
- C. Foundation Design: The foundation design shall be based on soils that meet or exceed those of a Class 5 material as defined by 2015 IBC Table 1806.2.
- D. Poles A3, A1 and B1 need new pole bases.

## 2.4 CONTROL

- A. Instant On/Off Capabilities with High/Med/Low dimming options: System shall provide for instant on/off of luminaires.
- B. System shall have two control zones.
  1. Football/Soccer
  2. All lights (Baseball/Softball)
- C. Lighting contactor cabinet(s) constructed of NEMA Type 4 aluminum, designed for easy installation with contactors, labeled to match field diagrams and electrical design. Manual off-on-auto selector switches shall be provided.
- D. Remote Lighting Control System: System shall allow owner and users with a security code to schedule on/off system operation via a web site, phone, fax or email up to ten years in advance. Manufacturer shall provide and maintain a two-way TCP/IP communication link. Trained staff shall be available 24/7 to provide scheduling support and assist with reporting needs.
- E. The owner may assign various security levels to schedulers by function and/or fields. This function must be flexible to allow a range of privileges such as full scheduling capabilities for all fields to only having permission to execute "early off" commands by phone. Scheduling tool shall be capable of setting curfew limits.
- F. Controller shall accept and store 7-day schedules, be protected against memory loss during power outages, and shall reboot once power is regained and execute any commands that would have occurred during outage.
- G. Remote Monitoring System: System shall monitor lighting performance and notify manufacturer if individual luminaire

outage is detected so that appropriate maintenance can be scheduled. The controller shall determine switch position (manual or auto) and contactor status (open or closed).

- H. Management Tools: Manufacturer shall provide a web-based database and dashboard tool of actual field usage and provide reports by facility and user group. Dashboard shall also show current status of luminaire outages, control operation and service. Mobile application will be provided suitable for IOS, Android and Blackberry devices.
- I. Hours of Usage: Manufacturer shall provide a means of tracking actual hours of usage for the field lighting system that is readily accessible to the owner.
  - 1. Cumulative hours: shall be tracked to show the total hours used by the facility
  - 2. Report hours saved by using early off and push buttons by users.
- J. Communication Costs: Manufacturer shall include communication costs for operating the controls and monitoring system for a period of 25 years.

### **PART 3 - EXECUTION**

#### **3.1 BASE DESIGN**

- A. It shall be the lighting manufacturers responsibility to provide pole basis designed to withstand the wind load rating for the pole and fixture assembly for the site location; Sandpoint, Idaho, USA.
- B. The base design shall be performed by a licensed professional structural engineer. Shop drawings for the base design shall be furnished bearing the structural engineer's signed stamp.
- C. Upon request the base calculations shall be provided to the City of Sandpoint, architect and engineer.
- D. The base design shall include all grounding requirements.
- E. The contractor shall install the lighting base and provide grounding per the manufacturer's and NEC requirements.

#### **3.2 SOIL QUALITY CONTROL**

- A. It shall be the Contractor's responsibility to notify the Owner if soil conditions exist other than those on which the foundation design is based, or if the soil cannot be readily excavated. Contractor may issue a change order request / estimate for the Owner's approval / payment for additional costs associated with:
  - 1. Providing engineered foundation embedment design by a registered engineer in the State of Washington for soils other than specified soil conditions;
  - 2. Additional materials required to achieve alternate foundation;
  - 3. Excavation and removal of materials other than normal soils, such as rock, caliche, etc.

### 3.3 POWER DISTRIBUTION AND GROUNDING

- A. Provide conduit and wiring buried a minimum of 36" below grade with traceable marking tape at 12" below finish grade. Route conduit outside artificial turf footprint as much as possible if required to be under turf route as close to edge as possible.
- B. Provide pull boxes at each of the fixture pole bases.
- C. Provide a minimum of (2) 10'x5/8" copper clad ground rod at each pole, separated by a minimum of 10'-0". The ground rod top shall be 6" below finished grade and located on the as-built drawings.

### 3.4 DELIVERY TIMING

- A. Delivery Timing Equipment On-Site: The equipment must be on-site 6-8 weeks from receipt of approved submittals and receipt of complete order information.

### 3.5 FIELD QUALITY CONTROL

- A. Illumination Measurements: Upon substantial completion of the project and in the presence of the Contractor, Project Engineer, Owner's Representative, and Manufacturer's Representative, illumination measurements shall be taken and verified. The illumination measurements shall be conducted in accordance with IESNA LM-5-04.
- B. Field Light Level Accountability
  - 1. Light levels are guaranteed not to fall below the target maintained light levels for the entire warranty period of 25 Years.
  - 2. The contractor/manufacturer shall be responsible for an additional inspection one year from the date of commissioning of the lighting system and will utilize the owner's light meter in the presence of the owner.
  - 3. The contractor/manufacturer will be held responsible for any and all changes needed to bring these fields back to compliance for light levels and uniformities. Contractor/Manufacturer will be held responsible for any damage to the fields during these repairs.
- C. Correcting Non-Conformance: If, in the opinion of the Owner or his appointed Representative, the actual performance levels including footcandles and uniformity ratios are not in conformance with the requirements of the performance specifications and submitted information, the Manufacturer shall be required to make adjustments to meet specifications and satisfy Owner. Post installation adjustments shall include re-aiming fixtures, adding shielding and providing nighttime field measured documentation to verify that the lighting trespass footcandle and glare candela levels comply with the city of Spokane Valley. The contractor shall upon request conduct a demonstration to the city and owner's representatives to confirm that the installation satisfies these requirements. The contractor shall provide all equipment including lifts to perform these adjustments and measurements.

### 3.6 WARRANTY AND GUARANTEE

- A. 25-Year Warranty: Each manufacturer shall supply a signed warranty covering the entire system for 25 years from the date of shipment. Warranty shall guarantee specified light levels. Manufacturer shall maintain specifically-funded financial reserves to assure fulfillment of the warranty for the full term. Warranty does not cover weather conditions events such as lightning or hail damage, improper installation, vandalism or abuse, unauthorized repairs or alterations, or product made by other manufacturers.
- B. Maintenance: Manufacturer shall monitor the performance of the lighting system, including on/off status, hours of usage and luminaire outage for 25 years from the date of equipment shipment. Parts and labor shall be covered such that individual luminaire outages will be repaired when the usage of any field is materially impacted. Owner agrees to check fuses in the event of a luminaire outage.

## PART 4 - MEASUREMENT AND PAYMENT

### FIELD SPORTS LIGHTING

- A. Relocation and installation of existing poles with new poles bases per lump sum. Includes furnishing all materials, equipment, labor, supervision, tools and items necessary for the installation, connection, testing and operation of all field sports lighting poles required for this project as shown on the Electrical Drawings specified herein
  - 1. Bid Schedule Payment Reference: SP20.4.1.A.1
  - 2. Bid Schedule Description: Section included in multiple bid schedule items
    - a. Relocate and Install Existing Field Light Poles (2) to new location.
- B. Upgrade Existing Field Lights to LED Fixtures per lump sum. Includes furnishing all materials, equipment, labor, supervision, tools and items necessary for the installation, connection, testing and operation of all field sports lighting required for this project as shown on the Electrical Drawings specified herein
  - 1. Bid Schedule Payment Reference: SP20.4.1.B.1
  - 2. Bid Schedule Description: Section included in multiple bid schedule items
    - a. Upgrade Existing Field Lights to L.E.D. Fixtures.
- C. Provide and install New Field Light pole and base with new LED Fixtures per lump sum. Includes furnishing all materials, equipment, labor, supervision, tools and items necessary for the installation, connection, testing and operation of all field sports lighting required for this project as shown on the Electrical Drawings specified herein
  - 1. Bid Schedule Payment Reference: SP20.4.1.C.1
  - 2. Bid Schedule Description: Section included in multiple bid schedule items



- a. New Field Light Pole w/ L.E.D. Fixtures



## **SP15 Common Work Results**

### **PART 1 – GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary, apply to this section.

#### **1.2 SUMMARY**

- A. The work under this division includes furnishing all materials, equipment, labor, supervision, tools and items necessary for the construction, installation, connection, testing and operation of all electrical work for this project as shown on the Electrical Drawings specified herein.
- B. Related Work Described Elsewhere: Where other divisions require electrical materials or installations comply with all applicable requirements herein. Provide all electrical materials and installation work required to connect, test and operate equipment required by other divisions. Electrical installations required by other divisions but not shown on the electrical drawings shall be provided.
- C. Warranty: The Contractor shall guarantee all work installed under this specification and make good, repair or replace at his own expense, any defective work, materials or parts.

#### **1.3 REGULATIONS**

- A. Codes and Ordinances: Comply with all applicable codes, ordinances and regulations including the National Electrical Code, the Idaho Administrative Code, National Electrical Safety Code, WISHA, NFPA, and all other national, state and local codes and ordinances. Notify the Engineer of any non-compliance in contract documents to applicable codes and regulations prior to installation of the work. Changes in the work after initial installation due to requirements of code enforcing agencies shall be at no additional cost to the Owner.
- B. Permits: Provide and pay for all permits and fees required for this project. In addition to paying for all permits and fees, the Contractor shall be responsible for contacting the various Approving Authorities, arranging for review of shop drawings where appropriate, scheduling inspections in a timely manner, and making necessary corrections as required by the Approving Authorities.
- C. Approving Authority: It is the Contractor's responsibility to ascertain and contact the appropriate "Approving Authorities" for this project.

Approving Authorities will include, but not be limited to the electrical inspector and the Fire Marshal having jurisdiction.

- D. Certificate of Inspection: Obtain a Certificate of Electrical Inspection from the local inspecting authority indicating final acceptance.
- E. Safety Measures to be Taken: The Engineer has not been retained or compensated to provide design and construction review services relating to the Contractor's safety precautions or to means, methods, techniques, sequences or procedures required for the Contractor to perform his work. The Contractor will be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours. The duty of the Engineer to conduct construction observations of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures, in, on or near the construction site.

#### 1.4 DRAWINGS AND SPECIFICATIONS

- A. Intent: The Electrical Drawings and specifications are intended to include all labor and materials necessary to provide a complete and operating facility. Any materials shown and called for on the drawings but not mentioned in the specifications, or vice versa, which are necessary for the proper completion of the installation or operation of the equipment, shall be furnished the same as if specifically called for in both. By submitting a bid, the Contractor is acknowledging that he has made a thorough examination of the contract documents, existing site conditions, and has determined that these documents and conditions do sufficiently describe the scope of construction work required under this contract. Any questions regarding interpretation of the contract documents shall be made in writing in a timely manner prior to the bid date to allow reasonable time for resolution of the questions.
- B. Diagrammatic Drawings: The Electrical Drawings are diagrammatic and do not show exact or complete raceway and wiring configurations, routing, rating or the necessary number and types of raceway fittings or pull boxes. Provide all labor and materials required to execute the work.

#### 1.5 SUBMITTALS AND SHOP DRAWINGS

- A. It is the Contractor's responsibility to thoroughly review vendor-assembled shop drawings, catalog cuts, etc. to ensure that these documents are complete and comply with the specifications.
- B. All submittals and shop drawings must be stamped by the Electrical Contractor and the General Contractor confirming that they have been reviewed

and comply with the contract documents. Submittals that are not stamped will be returned without being reviewed.

- C. Submittal Format:
  - 1. General: The submittals must include all specified material. Multiple submittals will not be accepted.
  - 2. Submittals: Electronic submittals are acceptable.
  - 3. Shop Drawings: One electronic (PDF) copy.
- D. Review: The review of a manufacturer's name or product does not relieve the Contractor of the responsibility for providing materials and equipment which comply in all details with the requirements of the contract documents. Contractor shall be solely responsible for submitting materials at such a time to allow a minimum of two weeks for Engineer's review.

#### 1.6 OPERATIONS AND MAINTENANCE MANUALS

- A. Prepare operations and maintenance manuals for all equipment installed on this project.
- B. Provide table of contents at front of manual indicating general content of each section. Provide index for each section of the manual with complete equipment catalog item or identification.
- C. The information and diagrams included must be on the specific equipment installed for this project. General "product line" information is not acceptable. The equipment model and catalog numbers with appropriate prefixes and suffixes must be clearly indicated on the data sheets. Manuals shall contain shop drawings, schematic and wiring diagrams (showing all external connections), parts lists, operating and maintenance information. Any modifications to equipment in the field shall be updated on the drawings, diagrams, etc., to reflect the "as-built" conditions.
- D. One preliminary copy shall be submitted to the Engineer for review 30 days prior to completion of the project. Submit electrical copies for distribution.

#### 1.7 RECORD DRAWINGS

- A. A record shall be made during the progress of the project indicating the work as actually installed. Corrections and changes shall be kept up to date at all times on a separate set of record drawings kept at the job site for review. Mark-ups may be schematic as related to interior raceway systems; however, all raceways shall be shown in proper relationship with junction boxes, panelboards, devices and equipment. Raceways installed below grade shall be shown with both horizontal and vertical dimensions with an accuracy of  $\pm$  six inches.
- B. Project Closeout: At completion of the project, the Contractor shall provide as-built drawings indicating work as revised, detailed and actually installed.

## 1.8 DEFINITIONS

- A. Telecommunications Room: MER/ER (MDF) or TR/TC (IDF)
- B. Provide: To furnish and install.
- C. Wiring: Raceway, conductors and connections.
- D. Exposed: Visible from occupied areas.
- E. Install: To set in position and make fully operational.
- F. Furnish: Purchase and deliver to the job site.
- G. Required: As required by code, Authority Having Jurisdiction or contract documents for the system and/or installation to be fully operational.

## 1.9 COORDINATION

### A. UTILITIES SERVICES

1. Scope: It shall be the Contractor's responsibility to contact all utility companies, including but not limited to the power company, Telephone Company and cable television company, to verify the extent of the work to be performed by the utility companies. All other labor and materials, necessary, but not provided by the utility companies, shall be provided by the Contractor.
2. Coordination and scheduling of new services with the various utility companies is the sole responsibility of the Contractor.
3. In general, the Contractor shall be responsible for providing the following:
  - a. Trenching, backfill and compaction.
  - b. Raceways.
  - c. Manholes and vaults (including grounding).
  - d. Concrete encasement of raceways (where called out on the drawings or specified).
  - e. Obtaining all necessary permits.
  - f. Service Charges: All utility service charges will be paid by the Owner.
  - g. Application for Services: It shall be the Contractor's responsibility to complete and submit all required applications for service with the various utility companies.
  - h. Right-of-Way Improvements:
    - 1) It shall be the Contractor's responsibility to contact all utility companies, including, but not limited to, the power company, telephone company and cable television company, to verify the extent of work to be performed by the utility companies. All other labor and materials necessary, but not provided by the utility companies, shall be provided by the Contractor.

- 2) Coordination and scheduling with the various utility companies is the sole responsibility of the Contractor.
- i. In general, the Contract shall be responsible for providing the following:
  - 1) Trenching, backfill and compaction.
  - 2) Raceways.
  - 3) Manholes and vaults (including grounding).
  - 4) Concrete encasement of raceways (where called out on the drawings or specified).
  - 5) Obtaining all necessary permits.
  - 6) Service Charges: All utility service charges shall be paid by the Owner.
- j. Work of Other Trades: The Electrical Drawings do not show complete details of the building construction. Refer to the Architectural, Structural, Civil, Landscape Drawings for those details which may affect the execution of this work. Specific locations of construction features shall be obtained from the reference drawings, field measurements, or the trade providing the material or equipment. No extra payments will be allowed for failure to obtain this information.
- k. The Contractor will not be paid for work requiring reinstallation due to lack of coordination prior to installation such as removing and replacing, relocating, cutting, patching or finishing. Special attention is called to the following items and all conflicts shall be coordinated prior to installation:
  - l. Light switches will be located on the "strike" side of the door.
  - m. All electrical outlets, lighting fixtures and other electrical outlets and equipment are installed to avoid conflict with grilles, pipes, sprinkler heads, ducts and other mechanical equipment.
  - n. Electrical outlets, lighting fixtures and equipment are to be installed in proper relation to cabinets, counters, doors and other Architectural appurtenances.
  - o. Electrical characteristics (HP, KVA, voltage, phase, fusing, overload protection) of actual equipment furnished under other divisions being different from that shown on the electrical drawings.
  - p. Provide access panels for electrical items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 08, Section 083113, "Access Doors and Frames."

- q. Provide all required firestopping for electrical work. Firestopping is specified in Division 07, Section 078413, "Penetration Firestopping."

## **PART 2 – PRODUCTS**

### **2.1 STANDARD OF QUALITY**

- A. General: Whenever any material or equipment is specified by patent or proprietary name or by the name of the manufacturer, such specification shall establish the minimum standard of quality in that particular field of manufacture. The engineer shall be the sole and final judge as to quality and acceptability of substitutions, no exceptions.

### **2.2 PRODUCT LISTING AND LABELING**

- A. All electrical equipment shall be Underwriters Laboratories listed and labeled. Equipment in compliance with UL standards but not bearing their label is not acceptable. If the manufacturer cannot arrange for labeling of an assembled unit at the factory, the necessary inspection and acceptance by the testing facility shall be performed in the field at no additional cost to the Owner and be acceptable to the Authority Having Jurisdiction.

## **PART 3 – EXECUTION**

### **3.1 GENERAL**

- A. All materials shall be new, free from defects and arrive at the job site in their original unopened containers.
- B. Comply with NECA 1. Where conflict exists between NECA 1 and the contract documents the most restrictive/expense shall govern.

### **3.2 MATERIAL STORAGE**

- A. Make all necessary provisions for storing materials and equipment at site so as to ensure the quality and fitness of the items to be incorporated in the work. Equipment shall be stored to prevent damage and corrosion.

### **3.3 INTERRUPTION OF EXISTING ELECTRICAL SERVICE**

- A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electrical services.
- B. Notify the Owner no fewer than 48 hours in advance of proposed interruption of electrical service.
- C. Do not proceed with interruption of electrical service without the Owner's written permission.



### 3.4 EXISTING CONDITIONS

- A. General: Specific scope of demolition work and operating conditions to be encountered shall be verified by on-site review prior to submitting bid. Demolition work in general is noted or shown on the documents based upon available "drawings of record" and may not show the actual conditions as they presently exist. The Contractor shall be responsible for removing or modifying the existing electrical installation as required by the building alterations. The Contractor shall be responsible for protection of existing equipment and wiring to be retained or reinstalled and shall replace any equipment damaged during the process of removal and reinstallation.
- B. Owner-Retained Equipment: The Owner may wish to retain certain specific items scheduled for demolition. The Contractor shall carefully remove these items, provide protection and packaging as may be required to protect the equipment and turnover said equipment to the Owner at a place designated on the jobsite. Any equipment that the Owner does not desire to retain shall become the property of the Contractor and be removed from the site. The following equipment shall be salvaged to the Owner:
  - 1. Fire alarm control panels
  - 2. Communication system and equipment racks
  - 3. Security system control panels
  - 4. Access system control panels
  - 5. CCTV cameras and headend equipment
  - 6. Public address system speakers and equipment
  - 7. Equipment noted on the drawings
- C. Existing Raceways and Wiring:
  - 1. No existing raceways or wiring shall be reused unless specifically shown on the drawings.
  - 2. Unused Raceways and Wiring: All unused conductors in existing buildings shall be removed. All unused raceway shall be removed except where located in or above existing construction which is not being altered and would require removal and replacement of the existing construction.
  - 3. Continuity of Service To and In Existing Building: The Contractor shall reroute existing raceways, wiring and equipment which is in conflict with building alterations. The Contractor's bid shall include intercepting and relocating existing raceways in 10 different locations throughout the project. These locations are in addition to those shown on the drawings. Each location shall be assumed to have four 3/4" EMT raceways that are each 100 lineal feet in length and each containing seven #12 AWG conductors which must be intercepted and relocated.

4. Ceiling Panels: Remove and reinstall all necessary panels in existing accessible ceilings, as required for the installation of electrical work. Where existing ceiling panels are damaged, they shall be replaced with new units. After ceiling removal and reinstallation is complete, the ceiling system appearance shall match adjacent similar ceilings that have not been removed.
5. Work Caused by Removal and Reinstallation of Existing Material: Existing electrical work which is to be removed and reinstalled as a result of the installation of work by other trades shall be performed by the Electrical Contractor at no additional expense to the Owner.
6. Existing fluorescent lamps and ballasts to be removed shall be assumed to contain PCBs/Mercury and are to be treated as hazardous materials. Removal and disposal of these fixtures are to comply with all local, state and federal agency requirements. Provide documentation as required by all regulating agencies as proof of proper disposal.
7. Openings in walls, floors and ceilings resulting from removal of conduits and/or devices are to be patched with materials equivalent to adjacent surfaces. Materials used for patching shall maintain the fire rating of the existing area.

### 3.5 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

- A. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

### 3.6 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. General:
  1. Provide sleeves for all penetrations unless core-drilled holes or formed openings are used.
  2. Extend sleeves installed in floors two inches above finished floor level.
  3. Size sleeves to provide 1/4-inch annular clear space between sleeve and raceway, unless indicated otherwise.
  4. Seal space outside of sleeves with grout for penetrations of concrete and masonry. Pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
  5. Interior Penetrations of Non-Fire-Rated Walls and Floors: Provide EMT sleeves. Seal space between sleeve and wall or floor using joint sealant appropriate for size, depth and location of joint.
  6. Roof-Penetration Sleeves: Provide a four-pound lead-plumbing vent flashing. Provide counter flashing attached above with a stainless-steel draw band clamp.

7. Aboveground, Exterior-Wall Penetrations: Provide steel pipe sleeves. Select sleeve size to allow for one-inch annular clear space between pipe and raceway. Seal penetration utilizing mechanical sleeve seals.
8. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for one-inch annular clear space between pipe and raceway. Seal penetration utilizing mechanical sleeve seals.

### 3.7 CUTTING AND PATCHING

- A. Provide all required cutting, demolition and patching required for the installation of the electrical work. Penetrations through structural walls, ceiling or floor slabs shall be core drilled. In no case shall structural members be penetrated without prior approval of the structural engineer.

### 3.8 PAINTING

- A. Touch up electrical equipment with factory finished surfaces as required using factory furnished paint. Do not paint screw heads, hinges, nameplates, hardware, etc. All surface-mounted raceways in finished areas shall be painted to match adjacent surfaces.

### 3.9 CLEANING

- A. Promptly remove waste material and rubbish resulting from electrical work.
- B. Prior to energizing equipment, remove all dirt and debris. Vacuum and wipe-down all surfaces.
- C. Clean all equipment and fixtures at completion of the project.

### 3.10 CONSTRUCTION OBSERVATION AND FINAL ACCEPTANCE

- A. Site Review: On-site meetings or reviews of construction by the Engineer shall not be construed as acceptance by these parties as related to quantities, rough-in locations, and compliance with code enforcing authorities.
- B. Testing: The Contractor shall test all wiring and all electrical equipment to verify absence of grounds and short circuits and verify proper operation, rotation and phase relationship. Contractor will be responsible for scheduling of tests and demonstrations at times mutually acceptable to the Owner. All equipment shall be demonstrated to operate in accordance with the requirements of this specification and the manufacturer's recommendations. Operate every device manually and automatically in accordance with its purpose. Tests shall be performed in the presence of the Owner or his designated representative. All instruments and personnel required to conduct the test shall be provided by the Contractor. Any test not witnessed by the Owner shall be waived by written document. All such documents must

become the property of the Owner upon completion of construction.

### 3.11 INSTRUCTION FOR OWNER'S PERSONNEL

- A. Scope: Following initial operation of all electrical equipment and prior to acceptance of the electrical work, conduct demonstrations of equipment operation and instruction periods for the Owner's representatives.
- B. Instruction Periods: Shall include preliminary discussion and presentation of information from maintenance manuals with appropriate references to drawings, followed by tours of equipment spaces explaining maintenance requirements, access methods, servicing and maintenance procedures, settings and available system and equipment adjustments.
- C. Contractor's representatives, in general, who conduct these instructions and demonstrations shall be qualified foremen or superintendents acquainted with this project and from the trade involved. For major equipment, lighting control systems and all low-voltage systems, the representative shall be the manufacturer's representatives with operating experience and substantial design experience on this project. Their qualifications shall be submitted to the Architect and Engineer before conducting the instruction period.
- D. Minimum Duration of Instruction Periods:
  - 1. Electrical Distribution System: Four hours.
  - 2. Communications, Safety and Security Systems: Four hours each unless noted otherwise.
  - 3. Refer to other sections of the specification for additional testing requirements.
- E. Scheduling of Instruction Periods: Provide notice of Contractor's readiness to conduct such instruction and demonstration periods to the Owner at least two weeks prior to each instruction period and reach agreement on the date of each instruction period.
- F. Prepare a written statement of acceptance for the Owner's signature. The statement shall be substantially as follows:

"I (the Contractor), the associated factory representatives and the subcontractor, have thoroughly tested each of the following systems and have proved their normal operation to the Owner's representative and have instructed him in the operation and maintenance thereof."

<u>Owner's System</u>	<u>Demonstrator</u>	<u>Representative Date</u>
1. Electrical Distribution & Lighting	_____	_____
2. Communications Systems	_____	_____
3. Safety and Security Systems	_____	_____

Owner's Representative

Date

Electrical Contractor

Date

- G. Send copies of this acceptance to the Architect and the Engineer and place one copy in each maintenance manual.
- H. Completion of Work: When requesting final inspection, provide ten-day notice. Submit written certifications that the work has been fully completed in strict accordance with the plans and specifications.

#### **PART 4 – MEASUREMENT AND PAYMENT**

##### **4.1 COMMON WORK RESULTS**

- A. SP15 Common Work Results is incidental to other special provisions in the bid schedule as listed below.
  - 1. Electrical Utility Relocation, Conduit Trenching & Fees (SP09.4.1.A).
  - 2. Relocate and Install Existing Field Light Poles (2) to new locations (SP14.4.1.A)
  - 3. Upgrade Existing Field Lights to L.E.D. Fixtures (SP14.4.1.B)
  - 4. New Field Light Pole w/ L.E.D. Fixtures (SP14.4.1C)
  - 5. Field Lighting Ground Improvements (SP10.4.1.A)
  - 6. Baseball Field Improvements (SP11.4.1.A)
  - 7. Phase II Electrical Preparation (SP12.4.1.A)
  - 8. Cable for Osprey Camera (SP13.4.1.A)

## **SP16 Low Voltage Electrical Power Conductors and Cables**

### **PART 1 – GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions.

#### **1.2 SUBMITTALS**

- A. Product Data: Submit for each type of product provided.

### **PART 2 – PRODUCTS**

#### **2.1 CONDUCTORS AND CABLES**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. American Insulated Wire
2. General Cable
3. Southwire

- B. Conductors: Stranded copper, or aluminum for feeders.

- C. Conductor Insulation: Type THHN-THWN, XHHW.

#### **2.2 FIRE-RATED CABLE**

- A. NFPA 70, Type MI (mineral insulated) with copper or aluminum conductors, copper sheath, two-hour fire-resistive rating, UL listed.

#### **2.3 CONNECTORS AND SPLICES**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. O-Z/Gedney
2. 3M
3. Tyco

- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

### **PART 3 – EXECUTION**

#### **3.1 CONDUCTOR MATERIAL APPLICATIONS**

- A. Feeders: Stranded Copper or Aluminum.
- B. Branch Circuits: Stranded Copper or #12 Solid Copper.

#### **3.2 CONDUCTOR INSULATION AND WIRING METHODS**

- A. Service Entrance: Type THHN-THWN, single conductors in raceway.
- B. Feeders: Type THHN-THWN, single conductors in raceway.
- C. Branch Circuits:
  1. Type THHN-THWN, single conductors in raceway.
  2. Provide dedicated neutral conductor for all branch circuits.

- D. Minimum Conductor Size:
  - 1. Neutral: #10 AWG (#12 AWG minimum for dedicated neutrals and lighting circuits).
  - 2. Ground: #12 AWG.
  - 3. Phase Conductors (more than six in a raceway): #10 AWG.
  - 4. Phase Conductors (six or less in a raceway): #12 AWG.
  - 5. Branch Circuit Homeruns (longer than 75 feet): #10 AWG.
- E. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, and strain relief device at terminations to suit application.
- F. Class 1 Control Circuits: Type THHN-THWN, in raceway.
- G. Class 2 Control Circuits: Type THHN-THWN, in raceway.

### 3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- B. Wiring from separate systems shall not be intermixed in a common junction box.
- C. Wiring shown in separate raceways shall not be combined.
- D. Feeders: Make no splices unless shown on the plans.
- E. Branch Circuits: Homeruns longer than 75 feet to the first outlet shall be #10 AWG minimum for the entire length of the circuit. Make no splices in homeruns.

### 3.4 CONNECTIONS

- A. General: Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- B. Feeder Splices: Make splices with hydraulically set long barrel connections insulated with heat shrink tubing.
- C. Lighting and Receptacle Branch Circuit Splices: Insulated screw-on type connectors.
- D. Wiring at Outlets: Install conductor at each outlet with at least six inches of slack.
- E. Below-Grade Splices: Make splices in handholes and insulate with epoxy resin-type splicing kits. 3M or equal.
- F. Termination at Busses (Panel, Switchboard, Transformers, ATS, etc.): Hydraulically-set compression lugs.

## PART 4 – MEASUREMENT AND PAYMENT

### 4.1 LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

- A. SP16 Low Voltage Electrical Power Conductors and Cables is incidental to other special provisions in the bid schedule as listed below.
  - 1. Relocate and Install Existing Field Light Poles (2) to new locations (SP14.4.1.A)

2. Upgrade Existing Field Lights to L.E.D. Fixtures (SP14.4.1.B)
3. New Field Light Pole w/ L.E.D. Fixtures (SP14.4.1C)
4. Field Lighting Ground Improvements (SP10.4.1.A)
5. Baseball Field Improvements (SP11.4.1.A)
6. Phase II Electrical Preparation (SP12.4.1.A)
7. Cable for Osprey Camera (SP13.4.1.A)



## **SP17 Grounding and Bonding**

### **PART 1 – GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions

#### **1.2 SUBMITTALS**

- A. Product Data: Submit for each type of product provided.

### **PART 2 – PRODUCTS**

#### **2.1 CONDUCTORS**

- A. Insulated Conductors: Stranded copper wire or cable insulated for 600 volts.
- B. Bare Copper Conductors: Stranded copper wire or cable.
- C. Grounding Bus: Rectangular bars of annealed copper, 1/4 by 2 by 12 inches in cross section with one inch (minimum) insulated spacers, unless otherwise indicated, with insulators.

#### **2.2 CONNECTORS**

- A. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.
- B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

#### **2.3 GROUNDING ELECTRODES**

- A. Ground Rods: Copper-clad, 3/4 inch by 10 feet.

### **PART 3 – EXECUTION**

#### **3.1 APPLICATIONS**

- A. Underground Grounding Conductors: Install bare copper conductor, No. 2/0 AWG minimum.
- B. Bury at least 24 inches below grade.
- C. Duct-Bank Grounding Conductor: Bury 12 inches above duct bank when indicated as part of duct-bank installation.
- D. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.
- E. Grounding Bus: Install in electrical rooms, telecommunications equipment rooms, in rooms housing transformers, and elsewhere as indicated.

- F. Install bus 18 inches above finished floor, unless otherwise indicated.
- G. Provide No. 2/0 AWG from each ground bus to building ground electrode system.
- H. Conductor Terminations and Connections:
  - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connections.
  - 2. Underground Connections: Welded connections.
  - 3. Connections to Structural Steel: Welded connections.

### 3.2 BONDING

- A. Insulated grounding bushings shall be installed to bond all feeder conduits to the transformer, switchboard, or panel ground bus at both ends of feeder raceways. Insulated grounding bushings shall also be installed in all feeder pull boxes to bond all conduits together. Jumpers or bonds shall be copper and sized in accordance with Table 250-95 of the National Electrical Code.

### 3.3 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

- A. Grounding Vaults and Handholes: Install a driven ground rod through manhole or handhole floor, close to wall, and set rod depth so four inches will extend above finished floor. If necessary, install ground rod before manhole is placed and provide No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from two inches above to six inches below concrete. Seal floor opening with waterproof, nonshrink grout.
- B. Grounding Connections to Vault Components: Bond exposed-metal parts such as inserts, cable racks, pulling irons, ladders, and cable shields within each vault or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, stranded, hard drawn copper bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields as recommended by manufacturer of splicing and termination kits.
- C. Pad-Mounted Transformers and Switches: Install two ground rods and ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items by connecting them to the grounding electrodes. Install tinned-copper conductor not less than No. 2 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than six inches from the foundation.

### 3.4 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors in all power and lighting raceways.
- B. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.
- C. Signal and Communication Equipment: Provide No. 4 AWG minimum insulated grounding conductor in raceway from building grounding electrode system to each telecommunications room, control panel and terminal cabinet.
- D. Telecommunications Rooms: Terminate grounding conductor on a 1/4" x 2" x 12" grounding bus unless otherwise indicated.
- E. Control Panels and Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.
- F. Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

### 3.5 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are two inches below finished floor or final grade, unless otherwise indicated.
- C. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating, if any.
- D. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- E. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
- F. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
- G. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly-mounted equipment.

- H. Use exothermic-welded connectors for outdoor locations. I. Grounding and Bonding for Piping:
  - 1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes using a bolted clamp connector or by bolting a lug-type connector to a pipe flange, using one of the lug bolts of the flange. Where a dielectric main water fitting is installed connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
  - 2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
- I. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.
- J. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet apart. Install tinned-copper conductor not less than No. 2/0 AWG between ground rods to form a ground ring. Bond columns to ground ring with No. 2/0 AWG.
- K. Ufer Ground (Concrete-Encased Grounding Electrode): Fabricate according to NFPA 70, using a minimum of 20 feet of bare copper conductor not smaller than No. 4 AWG.
- L. If concrete foundation is less than 20 feet long, coil excess conductor within base of foundation.
- M. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building grounding electrode system.

## **PART 4 – MEASUREMENT AND PAYMENT**

### **4.1 GROUNDING AND BONDING**

- A. SP17 Grounding and Bonding is incidental to other special provisions in the bid schedule as listed below.
  - 1. Relocate and Install Existing Field Light Poles (2) to new locations (SP20.4.1.A)
  - 2. New Field Light Pole w/ L.E.D. Fixtures (SP20.4.1C)
  - 3. Field Lighting Ground Improvements (SP10.4.1.A)
  - 4. Baseball Field Improvements (SP11.4.1.A)

## **SP18 Hangers and Supports**

### **PART 1 – GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions

#### **1.2 DEFINITIONS**

- A. EMT: Electrical metallic tubing.
- B. IMC: Intermediate metal conduit.
- C. RMC: Rigid metal conduit.

#### **1.3 SUBMITTALS**

- A. Product Data: Submit for each of the products provided.

### **PART 2 – PRODUCTS**

#### **2.1 SUPPORT, ANCHORAGE AND ATTACHMENT COMPONENTS**

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Cooper B-Line
  - 2. Thomas & Betts
  - 3. Unistrut
- C. Metallic Coatings: Hot-dip galvanized after fabrication.
- D. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating.
- E. Painted Coatings: Manufacturer's standard painted coating.
- F. Channel Dimensions: Selected for applicable load criteria.
- G. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- H. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

- I. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
  1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened Portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used. Subject to compliance with requirements, provide products by one of the following manufacturers:
    - a. Hilti
    - b. ITW Ramset/Red Head
    - c. Simpson Strong-Tie
  2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used. Subject to compliance with requirements, provide products by one of the following manufacturers:
    - a. Cooper B-Line
    - b. Hilti
    - c. ITW Ramset/Red Head
  3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
  4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
  5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
  6. Toggle Bolts: All-steel springhead type.
  7. Hanger Rods: Threaded steel.

## **PART 3 – EXECUTION**

### **3.1 APPLICATION**

- A. Conduit Crossing Structural Separation: Conduit that crosses structural or seismic separations between building units shall be installed with flexible connections, suitable to accommodate longitudinal and transverse displacements. Secure raceways each side of joint and provide minimum of 36 inches length flexible conduit between building units.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 3/8 inch in diameter.
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design

load limits. Secure raceways and cables to these supports with two-bolt conduit clamps.

- D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1- 1/2-inch and smaller raceways serving branch circuits and low-voltage systems above suspended ceilings and for fastening raceways to trapeze supports.

### 3.2 SUPPORT INSTALLATION

- A. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- B. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
  - 1. To Wood: Fasten with lag screws or through bolts.
  - 2. To New Concrete: Bolt to concrete inserts.
  - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
  - 4. To Existing Concrete: Expansion anchor fasteners. In lieu of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete four inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than four inches thick.
  - 5. To Steel: Beam clamps.
  - 6. To Light Steel: Sheet metal screws.
- C. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.
- D. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

### 3.3 CONCRETE BASES

- A. Provide four-inch high concrete pads with chamfered edges for all floor-mounted equipment including switchboards, distribution panels, transformers, motor control centers and unit substations.
- B. Construct concrete bases of dimensions indicated but not less than four inches larger in both directions than supported

unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.

- C. Use 3000-psi, 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Division 03 Section.
- D. Anchor equipment to concrete bases.

## **PART 4 – MEASUREMENT AND PAYMENT**

### **4.1 HANGERS AND SUPPORTS**

- A. SP18 Hangers and Supports is incidental to other special provisions in the bid schedule as listed below.
  - 1. Relocate and Install Existing Field Light Poles (2) to new locations (SP14.4.1.A)
  - 2. Upgrade Existing Field Lights to L.E.D. Fixtures (SP14.4.1.B)
  - 3. New Field Light Pole w/ L.E.D. Fixtures (SP14.4.1C)
  - 4. Field Lighting Ground Improvements (SP10.4.1.A)
  - 5. Baseball Field Improvements (SP11.4.1.A)



## **SP19 Raceway and Boxes**

### **PART 1 – GENERAL**

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions

#### 1.2 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. FMC: Flexible metal conduit.
- C. LFMC: Liquidtight flexible metal conduit.
- D. RMC: Rigid metal conduit.
- E. RNC: Rigid nonmetallic conduit.

#### 1.3 SUBMITTALS

- A. Product Data: Submit for each type of product provided.

### **PART 2 – PRODUCTS**

#### 2.1 METAL CONDUIT AND TUBING

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. AFC Cable
  - 2. Allied Tube
  - 3. Electri-Flex
- B. Rigid Metal Conduit (RMC):
  - 1. General: Comply with ANSI C80.1.
  - 2. Fittings:
  - 3. Couplings: Threaded metallic type of the same material as the conduit.
    - a. Locknuts: Steel up to two inches, malleable iron for 2-1/2 inches and larger.
    - b. Bushings: Bakelite or plastic up to two inches, malleable iron with insulating collar for 2-1/2 inches and larger.
    - c. Unions: Zinc plated malleable iron, three-piece coupling.
- C. Electrical Metallic Tubing (EMT):
  - 1. General: Comply with ANSI C80.3.
  - 2. Fittings:
    - a. 1-1/2 inches and smaller: Steel raintight type employing a split corrugated ring and tightening nut.
    - b. Two inches and larger: Steel set-screw-type containing dual set-screws on each side of coupling.

- D. Flexible Metallic Conduit (FMC):
  - 1. General: Zinc-coated steel.
    - a. Fittings: Steel, one- or two-screw clamp type.
- E. Liquid-Tight Flexible Metallic Conduit (LFMC):
  - 1. General: Flexible steel conduit with PVC jacket.
  - 2. Fittings: Galvanized steel, compression type.

## 2.2 NONMETALLIC CONDUIT AND TUBING

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. AFC Cable
  - 2. Anamet
  - 3. Electri-Flex
  - 4. Carlon
- B. Rigid Nonmetallic Conduit (RNC):
  - 1. General: Comply with NEMA TC 2, Type EPC-40-PVC, unless otherwise noted.
  - 2. Fittings: Comply with NEMA TC 3, same material as the conduit.

## 2.3 SURFACE METAL RACEWAYS (SMR)

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Thomas & Betts
  - 2. Wiremold
- B. Color: Ivory
- C. Single-Channel Raceway: Two-piece raceway with a single compartment and snap cover. Provide raceways with nominal dimensions as follows: Raceway fill shall not exceed 40%.
- D. Power Conductors:
  - 1. Up to Three #12 AWG Conductors: 21/32" x 3/4".
  - 2. Up to Six # 12AWG Conductors: 1-9/32" x 3/4".
- E. UTP Cables:
  - 1. Up to Two Cables: 1-9/32" x 3/4".
  - 2. Up to (15) Cables: 2-3/4" x 1-7/16".
  - 3. More than 15 Cables: Provide multiple raceways.
- F. Other Low-Voltage Cables:
  - 1. One Cable: 21/32" x 3/4".
  - 2. More Than One Cable: Size raceway for 40% full. Maximum raceway size shall be 2- 3/4" x 1-7/16".
- G. Two-Channel Raceway:
  - 1. Raceway fill shall not exceed 40 percent.

2. Provide where shown on the drawings.
3. Raceway: Two-piece raceway with divider and snap cover. Nominal dimensions shall be 4-3/4" x 1-3/4".
4. Device-Mounting Brackets: High-impact plastic bracket with trim plate. Trim plate shall overlap raceway cover for a seamless transition between cover fittings. Provide insert for each device installed. Provide blank insert where only one device is provided.

## 2.4 BOXES, ENCLOSURES AND CABINETS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- B. Small Sheet Metal Pull and Junction Boxes: Comply with NEMA OS 1.
- C. Hinged-Cover Enclosures: NEMA 250, Type 1, steel, continuous-hinge cover with flush latch, finished inside and out with manufacturer's standard enamel.
- D. Cabinets:
  1. NEMA 250, Type 1, galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
  2. Hinged door in front cover with flush latch and concealed hinge.
  3. Key latch to match panelboards.
  4. Provide metal barriers to separate wiring of different systems and voltage.

## PART 3 – EXECUTION

### 3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below, unless otherwise indicated:
  1. Exposed Conduit: RMC.
  2. Concealed Conduit, Above Ground: RMC.
  3. Underground Conduit: RNC with RMC elbows.
  4. Connection to Vibrating Equipment (Including Transformers and Motor-Driven equipment): LFMC.
  5. Boxes and Enclosures, Above Ground: NEMA 250, Type 3R.
  6. Indoors: Apply raceway products as specified below unless otherwise indicated:
    - a. Exposed, Not Subject to Physical Damage: EMT.
  7. Exposed and Subject to Physical Damage: RMC. Includes raceways in the following locations:
    - a. Loading docks.

- b. Corridors used for traffic of mechanized carts, forklifts and pallet-handling units.
  - 8. Concealed in Ceilings and Interior Walls and Partitions: EMT.
  - 9. Connection to Vibrating Equipment (Including Transformers and Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
  - 10. Damp or Wet Locations: RMC.
  - 11. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 3R, in damp or wet locations.
- B. Minimum Raceway Size:
- 1. General: 3/4 inches unless otherwise indicated.
  - 2. Raceways with no more than three No. 12 AWG conductors shall be 1/2 inches unless otherwise indicated.

### 3.2 INSTALLATION

- A. All raceways shall be concealed in finished areas. Where existing wall surfaces are inaccessible, surface metal raceways shall be provided. Raceways may be surface-mounted in unfinished equipment spaces such as mechanical rooms, electrical rooms, elevator machine rooms and attic spaces.
- B. All branch-circuit raceways in telecommunications rooms shall be concealed within wall.
- C. Install exposed raceways as high as possible, above ductwork, parallel or at right angles to building lines.
- D. Raceways shall not be installed in concrete slab or wall construction when passing through an expansion or earthquake joint.
- E. Raceways shall be installed in furred or suspended ceiling spaces with a minimum of 36 inches of flexible conduit crossing the expansion or earthquake joints. Secure raceways each side of joint.
- F. All raceways shall be installed parallel or at right angles to the building construction. This applies to all exposed raceways as well as all raceways above suspended ceiling.
- G. Raceways shall not be run under heavy equipment, footings or other structural elements that might adversely affect the integrity of the raceways system or building structure. All raceways installed above suspended ceilings shall be a minimum of six inches clear above top of ceiling system.
- H. Raceways shall not be installed in floor slabs or structural columns.
- I. Underground Metallic Raceways or Metallic Raceways in Contact with Concrete: Wrap conduit with 0.010-inch thick

pipe-wrapping plastic tape applied with a 50 percent overlap. 3M or equal.

- J. Pullboxes with Covers: Provided as shown on the drawings and as required by the NEC. All pullboxes shall be accessible.
- K. Exterior Walls: Conduits passing through exterior walls below grade and/or bridging an area which was previously excavated and backfilled shall be rigidly supported by a structurally reinforced concrete duct bank spanning between the building wall and a bearing surface on undisturbed earth.
- L. The interior and exterior of all conduits and other raceways shall be thoroughly cleaned of all material. All conduits shall be capped or plugged after installation.
- M. Keep raceways at least six inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- N. Complete raceway installation before starting conductor installation.
- O. Arrange stub-ups so curved portions of bends are not visible above the finished slab.
- P. Install no more than the equivalent of three 90-degrees bends in any conduit run except for communications, safety and security conduits, for which fewer bends are allowed.
- Q. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints.
- R. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.
- S. Provide pull strings in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.
- T. Install raceway sealing fittings at suitable, approved and accessible locations and fill them with listed sealing compound. Install each fitting for concealed raceways in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
  - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
  - 2. Where otherwise required by NFPA 70.
- U. Expansion-Joint Fittings for RNC: Install in each run of aboveground conduit that is located where environmental

temperature change may exceed 30 degrees F, and that has straight-run length that exceeds 25 feet.

1. Install expansion-joint fittings for each of the following locations, and provide type and quantity of fittings that accommodate temperature change listed for location:
  2. Outdoor Locations Not Exposed to Direct Sunlight: 125 degrees F temperature change.
  3. Outdoor Locations Exposed to Direct Sunlight: 155 degrees F temperature change.
  4. Indoor Spaces: Connected with the Outdoors without Physical Separation: 125 degrees F temperature change.
  5. Attics: 135 degrees F temperature change.
  6. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per degree F of temperature change.
  7. Install each expansion-joint fitting with position, mounting and piston setting selected according to manufacturer's written instructions for conditions at specific location at the time of installation.
- V. Flexible Conduit Connections: Use maximum of eight feet of flexible conduit for recessed and semirecessed lighting fixtures, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
1. Use LFMC in damp or wet locations subject to severe physical damage.
  2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.
- W. Recessed Boxes in Masonry Walls: Sawcut opening for box in center of cell of masonry block and install box flush with surface of wall.
- X. Floor Boxes: Set floor boxes level and flush with finished floor surface.

### 3.3 SURFACE METAL RACEWAYS

- A. Provide all required fittings for a complete installation.
- B. Raceways serving two-channel raceway shall be fully concealed within wall construction or above suspended ceiling U.O.N.
- C. Provide a separate, continuous ground conductor for all power circuits.

### 3.4 RACEWAYS AND CABLE INSTALLATION PATHWAYS FOR LOW-VOLTAGE SYSTEMS

- A. Installation of Raceways/Pathways for low-voltage systems shall be in accordance with the applicable portions of

ANSI/TIA/EIA-569-A, Commercial Building Standards  
for Telecommunications Pathways and Spaces.

- B. Raceways Above Lay-in Ceilings: Do not install cables in conduits that are supported from the ceiling suspension system. All conduits shall be supported independently of the ceiling support system.
- C. Raceways fill shall not exceed 40 percent.
- D. Bend radii for raceways shall meet the following requirements:
  - 1. If the raceway has an internal diameter of two inches or less, the bend radius must be at least six times the internal conduit diameter.
  - 2. If the raceway has an internal diameter of more than two inches, the bend radius must be at least 10 times the internal conduit diameter.
- E. There shall be no more than two 90 degrees bends between pull points in raceways without derating of the conduit capacity. The conduit capacity shall be derated by 15 percent for each additional 90 degrees bend. Increase conduit size as required to meet conduit fill requirements of this section with the derated capacity accounted for, or, provide pull boxes to eliminate 90 degrees bends as necessary to avoid having to derate conduit. Offsets shall be considered as equivalent to a 90 degrees bend. Pull boxes added to conduit runs as of result of this requirement shall be in accordance with this section.
- F. Raceways which are terminated at cable trays shall be supported from structure with a maximum distance of 24 inches from the tray. Raceways terminated at cable trays shall be bonded to the tray.
- G. Exterior raceways shall be Schedule 40 PVC with RMC elbows transitioning to RMC for Service Entrances. Interior conduit for vertical riser cable shall be RMC sized according to ANSI/TIA/EIA-568-A-5 or as indicated on the Contract Drawings. Interior raceways for horizontal cable shall be EMT, sized according to ANSI/TIA/EIA-568-A-5 standards or as indicated on the Contract Drawings.
- H. Flexible conduit shall be kept to a minimum and shall only be used with prior written approval in length not exceeding four feet. If used, flexible metal conduit shall be increased by one trade size for the application used.
- I. Raceways entering telecommunications rooms through the floor shall be terminated four inches above finished floor. Raceways entering the rooms from above shall be terminated four inches below the finished ceiling, but in no case shall the conduits terminate greater than 12 inches above the cable tray or distribution frame.

- J. Conduits and cutout openings between floors shall be sealed with removable and reusable firestopping material to accommodate adds, moves, and changes in the cabling system.
- K. All raceways used for routing of low-voltage cables shall have bushings at all stubouts.

### 3.5 INSTALLATION OF UNDERGROUND CONDUIT

- A. Direct-Buried Conduit:  
Excavate trench bottom to provide firm and uniform support for conduit.
  - 1. All backfill shall be imported structure fill or gravel borrow according to ISPWC standards.
  - 2. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in ISPWC Moving."
  - 3. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through the floor, unless otherwise indicated. Encase elbows for stub-up ducts throughout the length of the elbow.
  - 4. Elbows: All elbows shall be RMC.
    - a. Couple steel conduits to ducts with adapters designed for this purpose and encase coupling with three inches of concrete.
    - b. For stub-ups at equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches from edge of equipment pad or foundation.
    - c. Install insulated grounding bushings on terminations at equipment.

### 3.6 SLEEVE-SEAL INSTALLATION

- A. Install to seal underground, exterior wall penetrations.
- B. Use type and number of sealing elements recommended by manufacturer for raceway material and size. Position raceway in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.



## **PART 4 – MEASUREMENT AND PAYMENT**

### **4.1 RACEWAY AND BOXES**

- A. SP19 Raceways and Boxes is incidental to other special provisions in the bid schedule as listed below.
  - 1. Electrical Utility Relocation, Conduit Trenching & Fees (SP09.4.1.A).
  - 2. Relocate and Install Existing Field Light Poles (2) to new locations (SP14.4.1.A)
  - 3. Upgrade Existing Field Lights to L.E.D. Fixtures (SP14.4.1.B)
  - 4. New Field Light Pole w/ L.E.D. Fixtures (SP14.4.1C)
  - 5. Field Lighting Ground Improvements (SP10.4.1.A)
  - 6. Baseball Field Improvements (SP11.4.1.A)
  - 7. Phase II Electrical Preparation (SP12.4.1.A)
  - 8. Cable for Osprey Camera (SP13.4.1.A)

## **SP20 Identification**

### **PART 1 – GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions.

#### **1.2 SUBMITTALS**

- A. Product Data: Submit for each type of product provided.

### **PART 2 – PRODUCTS**

#### **2.1 RACEWAY IDENTIFICATION MATERIALS**

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.
- B. Color for Printed Legend:
  - 1. Lighting and Power Circuits: White letters on a black field.
  - 2. Other Low-Voltage Systems: White letters on a black field.
- C. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- D. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant two inches wide and compounded for outdoor use.

#### **2.2 FASTENERS FOR LABELS AND SIGNS**

- A. Stainless steel machine screws with nuts and flat and lock washers in outdoor locations, and contact-type permanent self adhesive in indoor locations.

#### **2.3 CONDUCTOR AND COMMUNICATION AND CONTROL-CABLE IDENTIFICATION MATERIALS**

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than three mils thick by one to two inches wide.
- B. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wrap-around type with circuit identification legend machine printed by thermal transfer or equivalent process.
- C. Write-On Tags: Polyester tag, 0.015 inch thick with corrosion-resistant grommet and polyester or nylon tie for attachment to conductor or cable. Uses permanent, waterproof, black ink marker recommended by tag manufacturer.

## 2.4 UNDERGROUND-LINE WARNING TAPE

- A. Description: Permanent, bright-colored, continuous-printed polyethylene tape.
  - 1. Compounded for permanent direct-burial service.
  - 2. Embedded continuous metallic strip or core.
  - 3. Printed legend shall indicate type of underground line.

## 2.5 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70 and 29 CFR 1910.145.
- B. Self-Adhesive Warning Labels: Factory printed, multicolor, pressure-sensitive adhesive labels configured for display on front cover, door or other access to equipment, unless otherwise indicated.
- C. Warning label and sign shall include, but are not limited to, the following legend: Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."

## 2.6 EQUIPMENT NAMEPLATES

- A. General: Nameplates shall be 1/16" thick laminated plastic with engraved letters.
- B. Color for Nameplates:
  - 1. Lighting and Power: White letters on a black field.
  - 2. Fire Alarm: White letters on a red field.
  - 3. Other Low-Voltage Systems: White letters on a black field.

## 2.7 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Cable Ties: Fungus-inert, self-extinguishing, one-piece, self-locking, Type 6/6 nylon cable ties.
  - 1. Minimum Width: 3/16 inch.
  - 2. Tensile Strength: 50 lb, minimum.
  - 3. Temperature Range: - 40 to +185 degrees Fahrenheit.
  - 4. Color: Black, except where used for color-coding.

# PART 3 – EXECUTION

## 3.1 APPLICATION

- A. Raceways and Duct Banks More Than 600 Volts Concealed within Buildings: Four-inch wide black stripes on 10-inch centers over orange background that extends full length of raceway or duct and is 12 inches wide. Stencil legend "DANGER: CONCEALED HIGH-VOLTAGE WIRING" with three-inch high black letters on 20-inch centers. Stop stripes at legends. Apply to the following finished surfaces:
  - 1. Accessible surfaces of concrete envelope.
  - 2. Around raceways in vertical shafts.

3. Exposed in the building.
  4. Concealed above suspended ceilings.
- B. Accessible Raceways More Than 600 Volt: Identify with "DANGER: HIGH-VOLTAGE" in black letters at least two inches high with self-adhesive vinyl labels. Repeat legend at 10-foot maximum intervals.
- C. Power-Circuit Conductor Identification: Use color-coding conductor tape for conductors No. 1/0 AWG and larger in vaults, pull and junction boxes, vaults and handholes. Identify source and circuit number of each set of conductors. Identify phase in addition to the above for single conductor cables.
- D. Branch-Circuit Conductor Identification: Use marker tape where there are conductors for more than three branch circuits in same junction or pull box. Identify each ungrounded conductor according to source and circuit number.
- E. Conductors to be Extended in the Future: Attach write-on tags to conductors and list source and circuit number.
- F. Auxiliary Electrical Systems Conductor Identification: Identify all control and low-voltage systems wiring as follows:
1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals and pull points. Identify by system and circuit designation.
  2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
  3. Coordinate identification with manufacturer's shop drawings.
- G. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable. Install underground-line warning tape for both direct-buried cables and cables in raceway.
- H. Equipment Identification Labels:
1. Switchboards and Distribution Panelboards: Provide nameplate that identifies the switchboard/distribution panel and the source panel. (Example: Distribution Panel No. 1/Fed from Main Service Switchboard - Bkr. No. 1.) Provide nameplate at each overcurrent device that identifies the device number and the load served. (Example: Bkr. No. 1/Panel A)
  2. Panelboards: Provide nameplate on the front of the panel cover that identifies the panel. (Example: Panel A.) Provide a nameplate concealed behind the door which identifies the panel and the source panel. (Example: Panel A, fed from Distribution Panel 1-Bkr. No. 2)

3. Transformers: Provide nameplate identifying the transformer, the source panel and the panel served. (Example: Transformer T1/fed from Distribution Panel 1, Bkr. No. 1/Serves Panel A)
  4. Disconnect Switches and Enclosed Controllers: Provide nameplate that identifies the source panel and load served. (Example: Panel A-1, 3, 5/Exhaust Fan No.1)
  5. Variable Frequency Drives: Provide nameplate which identifies the source panel and load served. (Example: Panel A-1, 3, 5/Exhaust Fan No. 1)
- I. Junction and Pull Box Identification: Mark the cover of all junction boxes and pull boxes to identify the system, circuits, or feeders contained within the box. Use red color for fire alarm. Circuits shall be identified by panelboards and specific circuit numbers contained within the junction box.
- J. Color-Coding for Phase and Voltage Level Identification, 600 Volt and Less: Use the colors listed below for ungrounded conductors:
1. Colors for 208/120-Volt Circuits:
    - a. Phase A: Black
    - b. Phase B: Red
    - c. Phase C: Blue
    - d. Neutral: White
    - e. Ground: Green
    - f. Travelers: Yellow
  2. Colors for 480/277-Volt Circuits:
    - a. Phase A: Brown
    - b. Phase B: Orange
    - c. Phase C: Yellow
    - d. Neutral: Gray
    - e. Ground: Green
    - f. Travelers: Lavender
  3. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of six inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- K. Arc Flash Hazard Labels:
1. Provide label on all distribution equipment that designates the appropriate PPE (Personal Protective Equipment) required for the hazard present. Labels to comply with the NEC and NFPA 70E. Submit sample of label to Engineer for review.
  2. Refer to Division 26, Section 260573, "Overcurrent Protective Device Coordination Study."

### 3.2 INSTALLATION

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Self-Adhesive Identification Products: Clean surfaces before application using materials and methods recommended by manufacturer of identification device.
- E. Attach nonadhesive signs and plastic labels with screws and auxiliary hardware appropriate to the location and substrate.
- F. System Identification Color Banding for Raceways and Cables: Each color band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- G. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at six to eight inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.
- H. Painted Identification: Prepare surface and apply paint according to Division 09 painting sections.

## PART 4 – MEASUREMENT AND PAYMENT

### 4.1 IDENTIFICATION

- A. SP20 Identification is incidental to other special provisions in the bid schedule as listed below.
  - 1. Relocate and Install Existing Field Light Poles (2) to new locations (SP14.4.1.A)
  - 2. Upgrade Existing Field Lights to L.E.D. Fixtures (SP14.4.1.B)
  - 3. New Field Light Pole w/ L.E.D. Fixtures (SP14.4.1C)
  - 4. Field Lighting Ground Improvements (SP10.4.1.A)
  - 5. Baseball Field Improvements (SP11.4.1.A)

## **SP21 Panelboards**

### **PART 1 – GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions.

#### **1.2 SUBMITTALS**

- A. Product Data: Submit for each type of panelboard, overcurrent protective device, transient voltage suppression device and accessory provided.

#### **1.3 COORDINATION**

- A. Coordinate layout and installation of panelboards and components with other construction including conduit, piping, equipment, and adjacent surfaces. Maintain required work-space clearances and required clearances for equipment access doors and panels.

#### **1.4 SELECTIVE COORDINATION**

- A. The emergency distribution system shall be selectively coordinated.

### **PART 2 – PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Panelboards and Overcurrent Protective Devices:
    - a. Square D
    - b. General Electric
    - c. Siemens
    - d. Eaton
  - 2. Transient Voltage Suppression Panelboards:
    - a. Square D
    - b. General Electric
    - c. Siemens
    - d. Eaton
- B. The basis of design for this project is Square D. Other manufacturers are acceptable only if their equipment dimensions are equal to or smaller than Square D.

#### **2.2 FABRICATION**

- A. Enclosures:
  - 1. Rated for environmental conditions at installed location.
    - a. Outdoor, Wet or Damp Locations: NEMA 250, Type 3R.
    - b. Kitchen Areas: NEMA 250, Type 4X, stainless steel.

2. Doors: Door-within-door type.
  3. Finish: Manufacturer's standard enamel finish over corrosion-resistant treatment or primer coat.
  4. Directory Card: Provide transparent protective cover, mounted in metal frame, inside panelboard door.
- B. Phase and Ground Buses:
1. Material: Hard-drawn copper, 98 percent conductivity or aluminum.
  2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors; bonded to box.
- C. Conductor Connectors: Suitable for use with conductor material.
1. Main and Neutral Lugs: Compression type.
  2. Ground Lugs and Bus Configured Terminators: Compression type.
  3. Feed-Through Lugs: Compression type suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
- D. Service Equipment Label: UL labeled for use as service equipment for panelboards with main service disconnect switches.
- E. Future Devices: Mounting brackets, bus connections, and necessary appurtenances required for future installation of devices.

## 2.3 SHORT-CIRCUIT RATING

- A. Series or fully rated to interrupt the symmetrical short-circuit current available at the terminals.

## 2.4 DISTRIBUTION PANELBOARDS

- A. Branch Overcurrent Protective Devices:
1. Circuit-Breaker Frame Sizes 125 Ampere and Smaller: Bolt-on circuit breakers.
  2. Circuit-Breaker Frame Sizes Larger Than 125 Ampere: Bolt-on circuit breakers; plug-in circuit breakers where individual positive-locking device requires mechanical release for removal.
- B. Doors: secured with vault-type latch with tumbler lock; keyed alike.

## 2.5 PANELBOARDS

- A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.
- B. Doors: concealed hinges; secured with flush latch with tumbler lock; keyed alike.



## 2.6 TRANSIENT VOLTAGE SUPPRESSION PANELBOARDS

- A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers.
- B. Doors: Door-within-door type, concealed hinges; secured with vault-type latch with tumbler lock; keyed alike.
- C. Transient Voltage Suppression Device: IEEE C62.41, integrally mounted, plug-in-style, solid-state, parallel-connected, sine-wave tracking suppression and filtering modules.
  - 1. Minimum Single-Impulse Current Ratings:
    - a. Line-to-Neutral: 100,000 ampere.
    - b. Line-to-Ground: 100,000 ampere.
    - c. Neutral-to-Ground: 50,000 ampere.
  - 2. Protection modes shall be as follows:
    - a. Line-to-neutral.
    - b. Line-to-ground.
    - c. Neutral-to-ground.
  - 3. EMI/RFI Noise Attenuation Using 50-ohm Insertion Loss Test: 55 dB at 100 kHz.
  - 4. Maximum Category C Combination Wave Clamping Voltage: 600-volt, line-to-neutral and line-to-ground on 120/208-volt systems.
  - 5. Maximum UL 1449 Clamping Levels:
    - a. 400-volt, line-to-neutral and line-to-ground on 120/208 volt.
    - b. 800-volt, line-to-neutral and line-to-ground on 277/480-volt systems.
  - 6. Withstand Capabilities: 3000 Category C surges with less than five percent change in clamping voltage.

## 2.7 OVERCURRENT PROTECTIVE DEVICES

- A. Molded-Case Circuit Breaker: UL 489 with interrupting capacity to meet available fault currents. Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250A and larger.

## 2.8 SPACE FOR FUTURE CIRCUIT BREAKERS OR FUSED SWITCHES

- A. Provide as indicated on the drawings. Spaces shall be completely equipped for the future addition of a circuit breaker or fused switch, including all mounting hardware and buss connections. Unless otherwise noted, spaces shall be sized to accommodate the following future circuit breaker or fused switch:

<u>Panel Rating</u>	<u>Minimum Space Ampacity</u>
100 Amperes	70 Amperes
225 Amperes	125 Amperes
400 Amperes	225 Amperes
600 Amperes	400 Amperes
800 Amperes	600 Amperes

## 2.9 INSTRUMENTATION

- A. Provide digital power monitor which displays:
  - 1. Phase-to-phase and phase-to-neutral voltage on all three phases.
  - 2. Current on all three phases and the neutral.
  - 3. Power factor, kW, and kVA.
  - 4. KWH, revenue-grade, nonresetable. KWH meter to have pulsed output, same as utility meter.

## PART 3 – EXECUTION

### 3.1 INSTALLATION

- A. Mount top of trim 74 inches above finished floor, unless otherwise indicated.
- B. Mount plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.
- C. Install overcurrent protective devices and controllers. Set field-adjustable switches and circuit-breaker trip ranges.
- D. Install filler plates in unused spaces.
- E. Stub four one-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four one-inch empty conduits into raised floor space or below slab not on grade.
- F. Arrange conductors in gutters into groups and bundle and wrap with wire ties.

### 3.2 DIRECTORY

- A. Provide a directory to indicate installed circuit loads. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.

### 3.3 IDENTIFICATION DEVICES

- A. Label each panelboard with an engraved laminated plastic nameplate as specified in Division 26, Section 260553, "Identification."

### 3.4 TESTING

- A. After all wiring is complete, all feeder and branch circuit terminations shall be checked with a torque wrench. Torque levels shall be in accordance with NETA Standard ATS unless otherwise specified by the manufacturer. A test report which gives the following information for each panelboard shall be submitted to the Engineer two weeks prior to final inspection:
  - 1. Size and insulation type of the phase, neutral and ground conductors.

2. Phase-to-phase and phase-to-neutral operating load voltage.
  3. Operating load current (each phase, neutral and ground).
- B. Phase-to-phase and phase-to-neutral conductor insulation resistance. Test shall be made with a DC "Megger" (500-volt minimum) type tester. If tests indicate faulty insulation (less than 8 megohms), the conductors shall be replaced and retested.
- C. A copy of the test report shall be included in the Operations and Maintenance Manual.

#### **PART 4 – MEASUREMENT AND PAYMENT**

##### **4.1 PANELBOARDS**

- A. SP21 Panelboards is incidental to other special provisions in the bid schedule as listed below.
  1. Baseball Field Improvements (SP11.4.1.A)

## **SP22 Wiring Devices**

### **PART 1 – GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 specification sections, apply to this section.

#### **1.2 SUBMITTALS**

- A. Product Data: Submit for each type of product provided.

#### **1.3 COORDINATION**

- A. Receptacles for Owner-Furnished Equipment: Match plug configurations.

### **PART 2 – PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Cooper
  - 2. Hubbell
  - 3. Leviton
  - 4. Pass & Seymour

#### **2.2 STRAIGHT BLADE RECEPTACLES**

- A. Dedicated Receptacles, 125-volt, 20 ampere, NEMA 5-20R. Subject to compliance with requirements, provide one of the following products:
  - 1. Cooper; 5252 (duplex)
  - 2. Hubbell; 5252 (duplex)
  - 3. Leviton; 5252 (duplex)
  - 4. Pass & Seymour; 5252 (duplex)
  - 5. Cooper; TR8300
  - 6. Hubbell; BR2OTR series
  - 7. Leviton; 8300-SGG
  - 8. Pass & Seymour; 63H
- B. Transient Voltage Surge Suppressor (TVSS) Receptacles, 120-volt, 20 ampere, NEMA 5-20R. Subject to compliance with requirements, provide one of the following products:
  - 1. Pass & Seymour; IG 6362-050
  - 2. Hubbell; IG 536ZOSA

#### **2.3 GFCI RECEPTACLES**

- A. General Description: Straight blade, non-feed-through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, and UL 943, Class A, and include indicator light that is lighted when device is tripped.

- B. Duplex GFCI Convenience Receptacles, 125-volt, 20 am-  
pere: Subject to compliance with requirements, provide one  
of the following products:
  - 1. Cooper; GF20
  - 2. Hubbell; GF20 LA series
  - 3. Pass & Seymour; 2084

#### 2.4 WEATHERPROOF RECEPTACLES

- A. Provide gasketed cast aluminum receptacle cover.

#### 2.5 DEVICE PLATES

- A. Finished Areas-Surface or Flush-Mounted: 302 stainless  
steel or approved equal
- B. Unfinished Areas-Surface-Mounted Devices: 4/S raised  
steel.

#### 2.6 FINISHES

- A. Color:
  - 1. Wiring Devices Connected to Normal Power System:  
Ivory.
  - 2. Wiring Devices Connected to Generator: Red.
  - 3. Isolated-Ground Receptacles: Orange.

### **PART 3 – EXECUTION**

#### 3.1 INSTALLATION

- A. Comply with NECA 1, including the mounting heights listed  
in that standard, unless otherwise noted.
- B. Coordination with Other Trades:
  - 1. Keep outlet boxes free of plaster, drywall joint com-  
pound, mortar, cement, concrete, dust, paint, and  
other material that may contaminate the raceway  
system, conductors, and cables.
  - 2. Install device boxes in brick or block walls so that the  
coverplate does not cross a joint unless the joint is  
troweled flush with the face of the wall.
  - 3. Install wiring devices after all wall preparation, includ-  
ing painting, is complete.
- C. Conductors: The length of free conductors at outlets for de-  
vices shall meet provisions of NFPA 70, Article 300 without  
pigtails.
- D. Device Installation:
  - 1. Replace all devices that have been in temporary use  
during construction or that show signs that they were  
installed before building finishing operations were  
complete.
  - 2. Keep each wiring device in its package or otherwise  
protected until it is time to connect conductors.

3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
  4. Connect devices to branch circuits using pigtails that are not less than six inches in length.
  5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.
  6. Use a torque screwdriver when a torque is recommended or required by the manufacturer.
  7. When conductors larger than No. 12 AWG are installed on 15- or 20-ampere circuits, splice No. 12 AWG pigtails for device connections.
  8. Tighten unused terminal screws on the device.
  9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.
- E. Receptacle Orientation: Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the right.
- F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.
- G. Arrangement of Devices: Unless otherwise indicated mount flush with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.
- H. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

### 3.2 IDENTIFICATION

- A. Receptacles: Laser-engrave faceplate with panel and circuit number.
- B. Special Receptacles Other Than 15 or 20 Ampere, 120 Volt: Laser-engrave faceplate with ampere rating, voltage, phase, panel and circuit number.
- C. Computer Receptacles: Laser-engrave "Computer" in 3/16 inches high letter on the top of the plate. Laser-engrave with panel and circuit number at the bottom of the plate.
- D. Receptacles Installed in a Multi-System Wall Box: Labeled with panel and circuit number utilizing a computer-generated printed self-adhesive label.

### 3.3 INSTALLED SPARE DEVICES

- A. Provide the following installed spare devices:

<u>Device</u>	<u>Quantity</u>
Dedicated Duplex Receptacle	2

- B. Spare devices shall include 150 feet of conduit, faceplates, NEMA 3R enclosure, all required wire, cutting, patching and painting for a complete installation. Location of these units to be determined by the Owner's representative at the site. The Contractor shall assume that these devices will be installed after all other work is completed. Installation shall occur on an accelerated (night/weekend) schedule. Unused devices are to be (turned over) to the Owner.

## PART 4 – MEASUREMENT AND PAYMENT

### 4.1 WIRING DEVICES

- A. SP22 Wiring Devices is incidental to other special provisions in the bid schedule as listed below.
1. Baseball Field Improvements (SP11.4.1.A)

## **SP23 Enclosed Switches and Circuit Breakers**

### **PART 1 – GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions.

#### **1.2 SUBMITTALS**

- A. Product Data: Submit for each type of enclosed switch, circuit breaker and accessory being provided.

#### **1.3 COORDINATION**

- A. Coordinate layout and installation of switches, circuit breakers, and components with other construction, including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

### **PART 2 – PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with the requirements, provide products by one of the following:
  - 1. Square D
  - 2. General Electric
  - 3. Siemens
  - 4. Eaton
- B. The basis of design for this project is Square D. Other manufacturers are acceptable only if their equipment dimensions are equal to or smaller than Square D.

#### **2.2 FUSIBLE AND NONFUSIBLE SWITCHES**

- A. Fusible Switch-600A and Smaller: NEMA KS 1, Type HD with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.
- B. Nonfusible Switch-600A and Smaller: NEMA KS 1, Type HD, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.

#### **2.3 MOLDED-CASE CIRCUIT BREAKERS AND SWITCHES**

- A. Molded-Case Circuit Breaker: NEMA AB 1 with interrupting capacity to meet available fault currents. Provide with the following features and accessories:
  - 1. Standard frame sizes, trip ratings, and number of poles.
  - 2. Lugs: Mechanical style with compression lug kits suitable for number, size, trip ratings, and conductor material.



3. Application Listing: Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
  - B. Molded-Case Switches: Molded-case circuit breaker with fixed, high-set instantaneous trip only, and short-circuit withstand rating equal to equivalent breaker frame size interrupting rating. Provide with the following features and accessories:
    1. Lugs: Mechanical style with compression lug kits suitable for number, size, trip ratings, and material of conductors.
    2. Application Listing: Type HACR for heating, air-conditioning, and refrigerating equipment.
- 2.4 ENCLOSURES
- A. Rated for environmental conditions at installed locations.
    1. Outdoor, wet or damp locations; NEMA 250, Type 3R.
    2. Kitchen Areas: NEMA 250, Type 4X, stainless steel.
    3. Other wet or damp indoor locations; NEMA 250, Type 4.

## **PART 3 – EXECUTION**

### **3.1 INSTALLATION**

- A. Control Equipment Mounted to Walls: Mount adjacent units at uniform height. Bolt units to wall or mount on lightweight structural-steel channels bolted to wall. Provide freestanding racks complying with Division 26, Section 260529, "Hangers and Supports," for controllers not located on walls.
- B. Floor-Mounted Control Equipment: Anchor to concrete base.
- C. Install fuses in each fusible switch.

### **3.2 IDENTIFICATION DEVICES**

- A. Label each switch and circuit breaker on engraved laminated plastic as specified in Division 26, Section 260553, "Identification."

### **3.3 ADJUSTING**

- A. Set field-adjustable switches and circuit-breaker trip ranges.

### 3.4 TESTING

- A. After all wiring to each unit is complete, the Electrical Contractor shall cooperate with the Mechanical Contractor in testing equipment for proper operation and correct wiring as required for proper operation. All connections shall be checked with a torque wrench. Torque levels shall be in accordance with NETA Standard ATS unless otherwise specified by the manufacturer. A test report which gives the following information for each motor shall be submitted to the Engineer two weeks prior to final inspection:
  - 1. All nameplate data (voltage, phase, full-load current, locked motor current, NEMA design, code letter, RPM, etc.)
  - 2. Measured no-load voltage at motor terminals (all phases)
  - 3. Measured full-load voltage at motor terminals (all phases)
  - 4. Full load operating current (all phases)
  - 5. Motor starter manufacturer and overload heater number (attach the manufacturer's table of overload heater numbers and corresponding motor nameplate ranges)
  - 6. Fuse size and type
  - 7. Motor phase-to-phase and phase-to-ground winding resistance (motors five-HP and larger)
- B. A copy of the test report shall be included in the Operations and Maintenance Manuals.

## PART 4 – MEASUREMENT AND PAYMENT

### 4.1 ENCLOSED SWITCHES AND CIRCUIT BREAKERS

- A. SP23 Enclosed Switches and Circuit Breakers is incidental to other special provisions in the bid schedule as listed below.
  - 1. Field Lighting Ground Improvements (SP10.4.1.A)
  - 2. Baseball Field Improvements (SP11.4.1.A)

## **SP24 Data-Telephone**

### **PART 1 – GENERAL**

#### **1.1 SCOPE OF WORK**

- A. Provide a complete cable network as indicated on the Drawings and Specifications. Provide equipment cabinets at concessions building as indicated on Drawings. Provide Category 6 Voice/Data patch panels. All cabling to be labeled as detailed herein. Owner to provide cross-connect labor and materials.
- B. Provide all voice/data outlet boxes, pull boxes, plates and jacks. The jacks for both voice and data shall be the same RJ-45 Category 6. There is no distinction between voice and data jacks, as cross connect cables determine jack function at the IDF panel.
- C. Provide Category 6 cables from the IDF voice/data patch panel to the individual voice/data jacks at the locations identified on the Drawing.
- D. All active electronic devices and patch cables provided by Owner.

#### **1.2 COMPLIANCE**

- A. The contractor installing the data cabling system shall be a fully Certified Cable System (CCS) company.
- B. Comply with NEC and BICSI as applicable to construction, pathways, and installation of cables, wires, spaces, cable support and connectors.
- C. Comply with EIA/TIA 568B, 606, and 607 standards for Category 6 cable, components, and installation (EIA/TIA 569).
- D. Comply with the current BICSI, TDM manual for installation and termination of fiber optic cable.

#### **1.3 PRODUCT SUBMITTALS AND AS-BUILT DRAWINGS**

- A. The submittal data shall be as follows:
  - 1. Catalog Cuts: Furnish for all standard (off-the-shelf) catalog items. Catalog number, manufacturer, rating specifications for each type of distribution device and for each type of equipment rack and cabinet shall all be shown.
  - 2. Shop Drawings: Furnish distribution system connection diagrams, riser diagrams and floor plan distribution system drawings.
  - 3. Copy of Pre-Registration Warranty submitted to manufacturer.
  - 4. Certificate of Calibration from the manufacturer(s) of all test equipment to be utilized during project.
  - 5. Submittals, when approved, shall be an addition to these specifications and shall be in equal force in that no variation shall be permitted except with the written approval of the Owner. The Owner's approval of equipment shall not relieve the Contractor's responsibility for errors, as said approval is only

general and is not intended to serve as a check and does not relieve the Contractor from furnishing materials and performing the work as required by the contract documents.

6. Three copies of submittals shall be submitted to the Project Manager for Owner's review. All information shall be folded to 8-1/2" x 11" in size. One (1) copy shall be returned to the Contractor. Contractor shall be responsible for making additional copies for his use.
7. Complete and accurate record drawings (and other required submittals) are important to the Owner. Proper documentation eliminates a significant amount of time and expense when maintenance, repair, alterations or expansion becomes necessary.
8. The Owner will not consider the obligations of the contract as being fulfilled, and will not grant final acceptance off the work of the contract until satisfactory record drawings (and other required submittals) have been received and reviewed.

## **PART 2 – PRODUCTS**

### **2.1 MATERIALS**

- A. Equipment and cabling shall meet the requirements of the Leviton system warranty.
- B. Raceways, boxes, etc., shall be as specified in SP19 able Supports and Wraps
  1. Cable J-Hook
    - a. Approved manufactures are Caddy, B-Line, or equal.
    - b. Bridle rings are not approved for use.
    - c. J-Hook width shall be minimum 3/4". Provide size appropriate for conductor quantity. Multi-Tier J-Hooks shall be provided to separate different low voltage systems where a common route or pathway is used.
  2. Tie-Wrap:
    - a. Approved manufactures are Leviton or equal.
    - b. Tie-Wraps shall be recloseable loop wrap style. Available in 1/2" wide, 15'-75'bulk rolls of Hook and Loop Wrap, Leviton # 43115-015 and 43115-075.
    - c. Plastic fasteners are not approved for use.
- C. Equipment Rack: Wall-Mount Cabinet, 25.2"H x23.6"W, 12 U, Black finish. Chatsworth #25504-712. with double sided type Finger Cable vertical wire management on each side and CPI #12816-705 120V,20A, power strip.
- D. Category 6 Voice/Data Patch Panels: Leviton, 24-port, #5G596-U24.
- E. Category 6 Cable: UTP cable shall be Data Grade meeting EIA/TIA 568B standards for Category 6 cable for application on 100 Mbps LAN system. The cable shall be Berk-Tek, 24 gauge, four twisted pair, solid copper conductors, plenum

rated for plenum areas or as noted in these specifications or the Drawings. Plenum rated cable shall be white in color. Non-plenum rated cable shall be blue in color. Cable routed underground shall be rated OSP for that application.

- F. Telephone cable: Berk-Tek 25 pair, #24 AWG, solid copper, color coded as per telephone industry standard. Cable routed underground shall be OSP-rated.
- G. Voice/Data Jacks: Leviton, RJ-45 configuration multi-media jack, 568B compliant, flush mount. Leviton #5G110-RI5, where "I" is color.
- H. Voice/Data concealed conduits shall be a minimum 1"C. No exception.

#### EIA/TIA 568B

#### MINIMUM CABLE & COMPONENT SPECIFICATIONS

Frequency	AWG	Impedance	Cable		Connectors		Channel	
	22/24	100+15%	Atten	Next	Atten	Next	Atten	Next
1 MHz			2.0db	65.3db	.1db	-65db	2.2db	>60.0
4 MHz			4.1db	56.3db	.1db	-65db	4.5db	53.5
10 MHz			6.5db	50.3db	.1db	-60db	7.1db	47.0
16 MHz			8.2db	47.3db	.2db	-56db	9.1db	43.6
20 MHz			9.3db	45.8db	.2db	-54db	10.2db	42.0
100 MHz			22.0db	35.3db	.2db	-40db	24.0db	30.1

### PART 3 – EXECUTION

#### 3.1 INSTALLATION

- A. All labels will be machine generated.
- B. All data device plates shall be labeled using the printed window labels showing room number, device box number, and jack number. Labeling sequence of device boxes shall occur in a counter-clockwise fashion when entering the room. (i.e. the third data jack in the second device box, in room 132 would be labeled as 132-2-3).
- C. Tag all cables at both ends and at all intermediate pull boxes. All cables, fiber optic and Category 6 shall be labeled with a Brady ID PAL professional printer/labeler printed label. Cabling shall be labeled on each end of wire with Brady ID PAL labels of 3/4" width or approved equal. Labeling shall be located within 4 inches of the end or termination of the wire / cable. Category 5e cables shall show room number, device

SPECIAL PROVISIONS

box number, jack number (see example above). Fiber optic cabling shall be labeled showing room number and strand number.

- D. All cables shall be run through walls in conduit stub-ups.
- E. Install Category 6 cables in a continuous length from IDF location to outlet locations. Outlets shall be cabled to the IDF in the same room. In rooms without a dedicated IDF, outlets shall be cabled to the nearest IDF on the same floor unless noted otherwise.
- F. LAN and other system cables in tunnels shall be supported with J-hooks on 3 foot centers. No other system cables shall be run with the data cables. Cables shall be loosely bundled (where grouped) and supported as required to prevent sharp bends or kinking. Support shall be adequate for the cable weight.
- G. Bond all systems stub-ups and raceways per NEC requirements.
- H. Sleeves shall be installed at each cable penetration through walls, floors and ceilings. Sleeves shall be minimum 3/4" with insulated inserts. Sleeves shall be installed regardless of wall type construction, fire rated or non-fire rated.
- I. At fire walls provide 2" rigid steel conduit threaded nipples with bushings (both sides) or EMT fitted with threaded, nylon throated end connectors. Provide fire seal as specified in Section 26 05 33 wherever passage through any type of fire wall is required.
- J. All cables must be terminated using a compression connection tool. All cables shall be installed using EIA/TIA 568, 569, 570, BICSI and standards as follows: Wire pair twists must be maintained to within 1/2" of IDC contacts on each jack, jacketing must be undamaged for the full length of the cable run and must continue to within 1/2" of IDC contacts on each jack, each end of each cable must be secured to the jack module with a velcro cable tie. Any cables damaged during pulling shall be the responsibility of the pulling party/parties (electrical contractor or LAN installer). Any failing or marginal tests (see above) shall be re-terminated, re-routed, re-tested, etc., until no other alternatives exist, at which time it will be assumed that a bad cable run (too much twisting of the cable, compression of jacketing and wire pairs, etc.) has resulted (at the discretion of the LAN Tester) and the pulling party/parties will have to bear the responsibility of re-pulling new cable to replace it.
- K. The Contractor shall:
  - 1. Provide raceway system as indicated. Open wiring is permitted within the tunnels provided plenum rated cables are neatly arranged and supported with J-hooks every 3 feet and in accordance with industry standards. Routing of cables in tunnels shall occur along sides of tunnels - stay away from center.

2. Provide category 6 cable from all computer outlets to IDF voice/data patch panels as indicated.
3. Provide fiber optic and copper backbone cables from IDF to MDF LIU patch panels as indicated.
4. Provide IDF panel enclosures.
5. Provide LIU fiber optic patch panel in IDF enclosure as indicated.
6. Provide category 6 voice/data patch panels in IDF enclosures and MDF rack as indicated.
7. Terminate all wires and fibers in all cables at both ends. Provide identification on all cables at both ends. Coordinate with Owner (if required) for actual connection points.
8. Provide all associated hardware as described above.
9. Active electronics are furnished by the Owner.
10. Category 6 patch cords and connection of those cords provided by Owner.
11. Provide drawings, patch panel documentation, full testing and required reports, and warranty all parts and labor (using newly installed cable tests as reference point) excluding outside physical damage or extreme conditions/circumstances.
12. At completion of pulling cable and making terminations, provide the owner with a complete as-built record drawing of the cabling system installation. Provide a hard copy booklet showing the arrangement of each terminal board, terminal block and the arrangement of the cables with each cable termination labeled.

### 3.2 TESTING

#### A. Cable Test

1. Perform cable tests in accordance with Cable Test set manufacturer's written instructions. All cables must pass at 100 Mhz.
2. Connect the NEXT test set to the cable to be tested at the centralized network location.
3. Correct malfunctions when detected and proceed with testing. Record test results on a standard UTP Category 6 Cable Test Results form. Contractor must guarantee the cabling meets EIA/TIA 568B performance specifications.

#### B. Final Test

1. Verify network distribution signal to all installed outlets. Where any outlet does not receive the proper network signal, repeat Category 6 cable and termination tests to determine the source of the problem.

### 3.3 DELIVERABLES

#### A. As-built drawings to include the following:

1. 3 hard copies of drawings.
2. Floor Plan shall show jack and equipment locations with applicable ID numbers.
3. Documented test results for installed system jacks, cabling, etc. noted in 3.02 above.

4. Manufacturers Certificate of Warranty.

**PART 4 – MEASUREMENT AND PAYMENT**

4.1 LAN DATA, TELEPHONE

A. SP24 LAN – Data - Telephone is incidental to other special provisions in the bid schedule as listed below.

1. Field Lighting Ground Improvements (SP10.4.1.A)
2. Baseball Field Improvements (SP11.4.1.A)



## **SP-27 - SITE FURNISHINGS**

### **PART 1 – GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Football Field Goals
  - 2. Baseball Base Set
  - 3. Baseball Home Plate
  - 4. Softball Base Set
  - 5. Softball Home Plate
  - 6. Softball Pitching Rubber
  - 7. Baseball Foul Poles
  - 8. Helical Pier Access Boxes

#### **1.2 RELATED SECTIONS**

- A. Special Provision 2 (SP2) – “Cement Treated Base (CTB)”
- B. Special Provision 3 (SP3) – “Synthetic Turf Base Aggregate Base Courses & Drainage Systems”
- C. Special Provision 4 (SP4) – “Synthetic Turf System”
- D. Special Provision 5 (SP5) – “Synthetic Turf System – Alternate # 1”
- E. Special Provision 6 (SP6) – “Chain-link Fence and Gates”
- F. Section 701 – Concrete Formwork
- G. Section 702 – Concrete Reinforcement
- H. Section 703 – Cast-in-Place Concrete
- I. Section 704 – Precast Concrete

#### **1.3 ACTION SUBMITTALS**

- A. Manufacturers Product Data: For each type of product.
  - 1. Product data specification sheets including, but not limited to:
    - a. Manufacturer
    - b. Model Number(s)
    - c. Color/Finish
  - 2. Provide manufacturers product data prior to actual field installation work.
  - 3. Shop Drawings:
    - a. Provide drawings of the manufacturers recommended installation and foundation requirements prior to actual field installation work.

#### **1.4 INFORMATIONAL SUBMITTALS**

- A. Anticipated lead time schedule for all site furnishings included in this and related sections.
  - 1. Approximate lead time for all products and anticipated delivery dates.

#### **1.5 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For site furnishings to include in maintenance manuals.

#### **1.6 QUALITY ASSURANCE**

- A. Manufacturers warranties shall pass to the Owner and certification made that the product materials meet all applicable grade trademarks or conform to

industry standards and inspection requirements. The Manufacturer shall have a current American Sports Builders Association (ASBA) Supplier Certificate of Distinction designation.

#### 1.7 PRODUCT DELIVERY AND STORAGE

- A. Materials delivered to the site shall be examined for damage or defects during shipping. Any defects shall be noted and reported to the Owner's Representative immediately. Replacements (if necessary) shall be immediately re-ordered, to minimize any conflicts with the construction schedule. Sound materials shall be stored above grade under protective cover or indoors to provide proper protection.

### PART 2 – MATERIALS

#### 2.1 FOOTBALL FIELD GOALS:

- A. Model #GP835HSH Hydraulically Hinged High School Football Goal Posts, Base Plate Mount and Accessories.
  - 1. As manufactured and supplied by Sportsfield Specialties, Inc. P.O. Box 231 41155 State Highway 10 Delhi, NY 13753 (888)-975-3343, ([www.sportsfieldspecialties.com](http://www.sportsfieldspecialties.com)).
  - 2. Components:
    - a. Single Base Plate Mount Gooseneck Support: Fabricated of (6") Schedule 40 Aluminum Pipe (6.625" O.D.), 5ft. Radius, 8ft. Offset.
    - b. Base Plate Mounting Kit
    - c. Crossbar: Fabricated of (6") Schedule 40 Aluminum Pipe 96.625" O.D.)
      - i. Length: 23'-4" High School
    - d. Uprights: Fabricated of extruded 6061-T6 Aluminum Tube (4" O.D.) with rigid wire loop welded to upper end.
      - i. Length: 35ft.
    - e. Powder Coated Finish: Color shall be Yellow
    - f. Installation Package Consisting of the Following Components:
      - i. Hydraulically Hinged Base Plate Mounting Kit.
      - ii. Required Access Frame Kit:
        - A. As manufactured and supplied by Sportsfield Specialties, Inc. P.O. Box 231 41155 State Highway 10 Delhi, NY 13753 (888)-975-3343, ([www.sportsfieldspecialties.com](http://www.sportsfieldspecialties.com)).
        - 1. Model #GPAFITRH (GP4570RH) Rotating & Hinged Access Frame with Infill Retainer System for Synthetic Turf Applications.
          - a. Include additional optional (#GPAFITRHC) Full Cover Plug, all aluminum construction with gasket seal.
    - g. Included Accessories:
      - i. Directional Wind Flags
      - ii. Touch-up Paint (Powder Coat Finish Specific)
      - iii. Model Specific Hardware Kit and Installation Instructions
    - h. Optional Accessories: None

## 2.2 BASEBALL BASE SET:

### A. SHAFIT – Schutt/Hollywood Anchor Access Frame Kit+ with Infill Retainer System for Synthetic Turf Applications. (Shall be used below 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> Plates)

1. As manufactured and supplied by Sportsfield Specialties, Inc. P.O. Box 231 41155 State Highway 10 Delhi, NY 13753 (888)-975-3343, ([www.sportsfieldspecialties.com](http://www.sportsfieldspecialties.com)).

#### a. SHAFIT – Schutt/Hollywood Anchor Access Frame for Infill Turf:

- i. Dimensions: 8-1/16"W x 8-1/16"L x 10"H
- ii. Box: 1/8" (0.125") Aluminum Construction, Welded Frame with Open Bottom Having the Following Attributes:
  - A. 1/8" (0.125") Aluminum Construction
  - B. Integrated Synthetic Infill Turf Attachment Ledge
  - C. Infill Retainer System with 1-1/4" (1.25") Flexible Gasket Seals Specifically Designed for Synthetic Infill Turf Applications
  - D. Anchor Base, Anchor Bolts and Anchor Spacer
  - E. 1" PVC Drain Stub for Positive Drainage Connection
- iii. Solid Cover: 1/8" (0.125") Aluminum Construction with the Following Attributes:
  - A. Infill Retainer System with 1-1/4" (1.25") Flexible Gasket Seals Specifically Designed for Synthetic Infill Turf Applications
  - B. Designed to Allow Synthetic Turf Material to be Adhered Directly to the Aluminum Surface with Appropriate Adhesive and/or Mechanical Fasteners as Determined by Others
- iv. Assembly Hardware

### B. SHIBL – Schutt/Hollywood Impact Base Set (Set of 3) for Synthetic Turf Applications

1. As manufactured and supplied by Sportsfield Specialties, Inc. P.O. Box 231 41155 State Highway 10 Delhi, NY 13753 (888)-975-3343, ([www.sportsfieldspecialties.com](http://www.sportsfieldspecialties.com)).

#### a. SHIBL – Schutt/Hollywood Impact Base Set (Set of 3) for Synthetic Turf Applications, Model #SHIBL.

- i. Premium, Professional Construction with Patented Chevron Design
- ii. Regulation Size: 15" x 15" x 2-1/2"
- iii. Includes (6") Base Stanchions
- iv. Ground Anchor Mounts: None
- v. Base Plugs: None

## 2.3 BASEBALL HOME PLATE:

### A. SHAFIT – Schutt/Hollywood Anchor Access Frame Kit+ with Infill Retainer System for Synthetic Turf Applications. (Shall be used under Home Plate).

1. As manufactured and supplied by Sportsfield Specialties, Inc. P.O. Box 231 41155 State Highway 10 Delhi, NY 13753 (888)-975-3343, ([www.sportsfieldspecialties.com](http://www.sportsfieldspecialties.com)).

- a. SHAFIT – Schutt/Hollywood Anchor Access Frame for Infill Turf:
  - i. Dimensions: 8-1/16"W x 8-1/16"L x 10"H
  - ii. Box: 1/8" (0.125") Aluminum Construction, Welded Frame with Open Bottom Having the Following Attributes:
    - A. 1/8" (0.125") Aluminum Construction
    - B. Integrated Synthetic Infill Turf Attachment Ledge
    - C. Infill Retainer System with 1-1/4" (1.25") Flexible Gasket Seals Specifically Designed for Synthetic Infill Turf Applications
    - D. Anchor Base, Anchor Bolts and Anchor Spacer
    - E. 1" PVC Drain Stub for Positive Drainage Connection
  - iii. Solid Cover: 1/8" (0.125") Aluminum Construction with the Following Attributes:
    - A. Infill Retainer System with 1-1/4" (1.25") Flexible Gasket Seals Specifically Designed for Synthetic Infill Turf Applications
    - B. Designed to Allow Synthetic Turf Material to be Adhered Directly to the Aluminum Surface with Appropriate Adhesive and/or Mechanical Fasteners as Determined by Others
  - iv. Assembly Hardware
- B. SHP-UM – Schutt/Hollywood MLB Universal Pro Style Home Plate for Synthetic Turf Applications
  - 1. As manufactured and supplied by Sportsfield Specialties, Inc. P.O. Box 231 41155 State Highway 10 Delhi, NY 13753 (888)-975-3343, ([www.sportsfieldspecialties.com](http://www.sportsfieldspecialties.com)).
    - a. SHP-UM – Schutt/Hollywood MLB Universal Pro Style Home Plate for Synthetic Turf Applications, Model #SHP-UM.
      - i. Official Size Hollywood MLB Universal Pro Style Home Plate with (7") Stanchion with (1) Ground Anchor and (1) Anchor Plug and (5) Zinc-Plated Mounting Spikes
      - ii. 1-1/2" Thick
      - iii. Permanent or Removable Installations
      - iv. High Durability Molded Rubber Construction

#### 2.4 SOFTBALL BASE SET:

- A. SHAFIT – Schutt/Hollywood Anchor Access Frame Kit+ with Infill Retainer System for Synthetic Turf Applications. (Shall be used below 2<sup>nd</sup> and 3<sup>rd</sup> Plates).
  - 1. As manufactured and supplied by Sportsfield Specialties, Inc. P.O. Box 231 41155 State Highway 10 Delhi, NY 13753 (888)-975-3343, ([www.sportsfieldspecialties.com](http://www.sportsfieldspecialties.com)).
    - a. SHAFIT – Schutt/Hollywood Anchor Access Frame for Infill Turf:
      - i. Dimensions: 8-1/16"W x 8-1/16"L x 10"H
      - ii. Box: 1/8" (0.125") Aluminum Construction, Welded Frame with Open Bottom Having the Following Attributes:
        - A. 1/8" (0.125") Aluminum Construction
        - B. Integrated Synthetic Infill Turf Attachment Ledge

- C. Infill Retainer System with 1-1/4" (1.25") Flexible Gasket Seals Specifically Designed for Synthetic Infill Turf Applications
      - D. Anchor Base, Anchor Bolts and Anchor Spacer
      - E. 1" PVC Drain Stub for Positive Drainage Connection
    - iii. Solid Cover: 1/8" (0.125") Aluminum Construction with the Following Attributes:
      - A. Infill Retainer System with 1-1/4" (1.25") Flexible Gasket Seals Specifically Designed for Synthetic Infill Turf Applications
      - B. Designed to Allow Synthetic Turf Material to be Adhered Directly to the Aluminum Surface with Appropriate Adhesive and/or Mechanical Fasteners as Determined by Others
    - iv. Assembly Hardware
- B. SHAFPRIT – Schutt/Hollywood Dual Anchor Access Frame Kit+ with Infill Retainer System for Synthetic Turf Applications. (Shall be used below 1<sup>st</sup> Plate).
  - 1. As manufactured and supplied by Sportsfield Specialties, Inc. P.O. Box 231 41155 State Highway 10 Delhi, NY 13753 (888)-975-3343, ([www.sportsfieldspecialties.com](http://www.sportsfieldspecialties.com)).
    - a. SHAFPRIT – Schutt/Hollywood Dual Anchor Access Frame for Infill Turf:
      - i. Dimensions: 6-1/16"W x 22-15/16"L x 10"H
      - ii. Box: 1/8" (0.125") Aluminum Construction, Welded Frame with Open Bottom Having the Following Attributes:
        - A. 1/8" (0.125") Aluminum Construction
        - B. Integrated Synthetic Infill Turf Attachment Ledge
        - C. Infill Retainer System with 1-1/4" (1.25") Flexible Gasket Seals Specifically Designed for Synthetic Infill Turf Applications
        - D. Dual Anchor Base, Anchor Bolts and Anchor Spacers
        - E. 1" PVC Drain Stub for Positive Drainage Connection
      - iii. Solid Cover: 1/8" (0.125") Aluminum Construction with the Following Attributes:
        - A. Infill Retainer System with 1-1/4" (1.25") Flexible Gasket Seals Specifically Designed for Synthetic Infill Turf Applications
        - B. Designed to Allow Synthetic Turf Material to be Adhered Directly to the Aluminum Surface with Appropriate Adhesive and/or Mechanical Fasteners as Determined by Others
      - iv. Assembly Hardware
- C. SHIDB – Schutt/Hollywood Impact Double First Base Set (Set of 3) for Synthetic Turf Applications.
  - 1. As manufactured and supplied by Sportsfield Specialties, Inc. P.O. Box 231 41155 State Highway 10 Delhi, NY 13753 (888)-975-3343, ([www.sportsfieldspecialties.com](http://www.sportsfieldspecialties.com)).

- a. SHIDB – Schutt/Hollywood Impact Double First Base Set (Set of 3) for Synthetic Turf Applications, Model #SHIDB.
  - i. Premium, Professional Construction with Patented Chevron Design
  - ii. One-Piece Molded Base
  - iii. 30" x 15" x 2-1/2" with (4") Stanchions
  - iv. Includes (2) impact Bases and (1) Double First Base

## 2.5 SOFTBALL HOME PLATE:

- A. SHAFIT – Schutt/Hollywood Anchor Access Frame Kit+ with Infill Retainer System for Synthetic Turf Applications. (Shall be used under Home Plate).
  - 1. As manufactured and supplied by Sportsfield Specialties, Inc. P.O. Box 231 41155 State Highway 10 Delhi, NY 13753 (888)-975-3343, ([www.sportsfieldspecialties.com](http://www.sportsfieldspecialties.com)).
    - a. SHAFIT – Schutt/Hollywood Anchor Access Frame for Infill Turf:
      - i. Dimensions: 8-1/16"W x 8-1/16"L x 10"H
      - ii. Box: 1/8" (0.125") Aluminum Construction, Welded Frame with Open Bottom Having the Following Attributes:
        - A. 1/8" (0.125") Aluminum Construction
        - B. Integrated Synthetic Infill Turf Attachment Ledge
        - C. Infill Retainer System with 1-1/4" (1.25") Flexible Gasket Seals Specifically Designed for Synthetic Infill Turf Applications
        - D. Anchor Base, Anchor Bolts and Anchor Spacer
        - E. 1" PVC Drain Stub for Positive Drainage Connection
      - iii. Solid Cover: 1/8" (0.125") Aluminum Construction with the Following Attributes:
        - A. Infill Retainer System with 1-1/4" (1.25") Flexible Gasket Seals Specifically Designed for Synthetic Infill Turf Applications
        - B. Designed to Allow Synthetic Turf Material to be Adhered Directly to the Aluminum Surface with Appropriate Adhesive and/or Mechanical Fasteners as Determined by Others
      - iv. Assembly Hardware
- B. SHP-UM – Schutt/Hollywood MLB Universal Pro Style Home Plate for Synthetic Turf Applications
  - 1. As manufactured and supplied by Sportsfield Specialties, Inc. P.O. Box 231 41155 State Highway 10 Delhi, NY 13753 (888)-975-3343, ([www.sportsfieldspecialties.com](http://www.sportsfieldspecialties.com)).
    - a. SHP-UM – Schutt/Hollywood MLB Universal Pro Style Home Plate for Synthetic Turf Applications, Model #SHP-UM.
      - i. Official Size Hollywood MLB Universal Pro Style Home Plate with (7") Stanchion with (1) Ground Anchor and (1) Anchor Plug and (5) Zinc-Plated Mounting Spikes
      - ii. 1-1/2" Thick
      - iii. Permanent or Removable Installations
      - iv. High Durability Molded Rubber Construction

## 2.6 SOFTBALL PITCHING RUBBER:

### A. SHAFPRIT – Schutt/Hollywood Dual Anchor Access Frame Kit+ with Infill Retainer System for Synthetic Turf Applications. (Shall be used below Pitching Rubber).

1. As manufactured and supplied by Sportsfield Specialties, Inc. P.O. Box 231 41155 State Highway 10 Delhi, NY 13753 (888)-975-3343, ([www.sportsfieldspecialties.com](http://www.sportsfieldspecialties.com)).

#### a. SHAFPRIT – Schutt/Hollywood Dual Anchor Access Frame for Infill Turf:

- i. Dimensions: 6-1/16"W x 22-15/16"L x 10"H
- ii. Box: 1/8" (0.125") Aluminum Construction, Welded Frame with Open Bottom Having the Following Attributes:
  - A. 1/8" (0.125") Aluminum Construction
  - B. Integrated Synthetic Infill Turf Attachment Ledge
  - C. Infill Retainer System with 1-1/4" (1.25") Flexible Gasket Seals Specifically Designed for Synthetic Infill Turf Applications
  - D. Dual Anchor Base, Anchor Bolts and Anchor Spacers
  - E. 1" PVC Drain Stub for Positive Drainage Connection
- iii. Solid Cover: 1/8" (0.125") Aluminum Construction with the Following Attributes:
  - A. Infill Retainer System with 1-1/4" (1.25") Flexible Gasket Seals Specifically Designed for Synthetic Infill Turf Applications
  - B. Designed to Allow Synthetic Turf Material to be Adhered Directly to the Aluminum Surface with Appropriate Adhesive and/or Mechanical Fasteners as Determined by Others
- iv. Assembly Hardware

### B. Schutt/Hollywood Official Size Dual Stanchion Pitching Rubber for Synthetic Turf Applications. (Shall be used as Pitching Rubber).

1. As manufactured and supplied by Sportsfield Specialties, Inc. P.O. Box 231 41155 State Highway 10 Delhi, NY 13753 (888)-975-3343, ([www.sportsfieldspecialties.com](http://www.sportsfieldspecialties.com)).

#### a. Schutt/Hollywood Official Size Dual Stanchion Pitching Rubber for Synthetic Turf Applications, Model #SHLBMPR224.

## 2.7 BASEBALL FOUL POLES

### A. Model #FPW420 – 20' Foul Pole with Wing, Ground Sleeve Mount.

1. As manufactured and supplied by Sportsfield Specialties, Inc. P.O. Box 231 41155 State Highway 10 Delhi, NY 13753 (888)-975-3343, ([www.sportsfieldspecialties.com](http://www.sportsfieldspecialties.com)).

#### 2. Components:

- a. 4" O.D. aluminum pole: Fabricated with two 6' wings (12' total wing length) of 1/8" stamped aluminum with double reinforced bends.
- b. Powder Coated Finish: Color shall be Yellow
- c. Inside Turf Installation Package Consisting of the Following Components:
  - i. 4'-0" Ground Sleeve Mounting Kit.
  - ii. Required Access Frame Kit:

- A. As manufactured and supplied by Sportsfield Specialties, Inc. P.O. Box 231 41155 State Highway 10 Delhi, NY 13753 (888)-975-3343, (www.sportsfieldspecialties.com).
  - 1. Model #RGAFIT (RG4570) Access Frame with Infill Retainer System for Synthetic Turf Applications.
    - a. Include additional optional (#GPAFITC) Full Cover Plug, all aluminum construction with gasket seal.
- d. Outside Turf Installation Package Consisting of the following components:
  - i. 4'-0" Ground Sleeve Mounting Kit.

## 2.8 HELICAL PIER ACCESS BOX

### A. Helical Pier Access Box:

- 1. TCTSQCVC - TurfCool™ Quick Connect Valve Box Synthetic Track Version as manufactured and supplied by:
  - a. Sportsfield Specialties, Inc. P.O. Box 231, 41155 State Highway 10, Delhi, NY 13753. 888-975-3343 (www.sportsfieldspecialties.com).
    - i. TCTSQCVC - TurfCool™ Quick Coupler or Gate Valve Box Track Surfacing
      - A. Dimensions: 18" W x 15" L x (length as required – field verify)
    - ii. Box: 3/16" (0.1875") Aluminum Construction, Welded Frame with Open Bottom Having the Following Attributes:
      - A. 1/8" (0.125") Aluminum Cover Ledge
      - B. Leveling Bolts
    - iii. Solid Cover: 1/8" (0.125") Aluminum Construction with the Following Attributes:
      - A. 1/2" (0.50") Recess Designed to Accept Synthetic Track Surfacing by Others
      - B. Secured with Cam Lock
    - iv. Assembly Hardware

## PART 3 – WORKMANSHIP

### 3.1 FOOTBALL FIELD GOAL BASE MOUNTS AND FRAME KITS

- A. All goal posts and accessories shall be installed as recommended per manufacturer's written instructions and as indicated on the drawings. Concrete anchoring foundations to be per drawings and specifications.

### 3.2 ANCHOR ACCESS FRAME KITS

- A. All anchor access frames for infill turf shall be installed as recommended per manufacturer's written instructions and as indicated on the drawings. Concrete anchoring foundations to be determined by the Contractor per manufacturer recommendations.



### 3.3 BASEBALL FOUL POLES:

- A. Baseball Foul Poles and accessories shall be installed as recommended per manufacturer's written instructions and as indicated on the drawings.

## **PART 4 – MEASUREMENT AND PAYMENT**

### 4.1 SECTION INCLUDES

- A. Football Field Goals – Includes all labor, materials, and equipment to install football field goal posts and turf boxes. Includes survey, layout, excavation, footings, goal posts and anchoring system, turf box setting, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per each.
  - 1. Bid Schedule Payment Reference: SP27.4.1.A
  - 2. Bid Schedule Description: Football Field Goals

### 4.2 SECTION INCLUDES

- A. Baseball Base Set - Includes all labor, materials, and equipment to install baseball base sets and turf access boxes. Includes survey, layout, excavation, turf box setting, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per each.
  - 1. Bid Schedule Payment Reference: SP27.4.2.A
  - 2. Bid Schedule Description: Baseball Base Set

### 4.3 SECTION INCLUDES

- A. Baseball Home Plate - Includes all labor, materials, and equipment to install baseball home plate and turf access box. Includes survey, layout, excavation, turf box setting, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per each.
  - 1. Bid Schedule Payment Reference: SP27.4.3.A
  - 2. Bid Schedule Description: Baseball Home Plate

### 4.4 SECTION INCLUDES

- A. Softball Base Set - Includes all labor, materials, and equipment to install softball base sets and turf access boxes. Includes survey, layout, excavation, turf box setting, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per each.
  - 1. Bid Schedule Payment Reference: SP27.4.4.A
  - 2. Bid Schedule Description: Softball Base Set

### 4.5 SECTION INCLUDES

- A. Softball Home Plate - Includes all labor, materials, and equipment to install softball home plate and turf access box. Includes survey, layout, excavation, turf box setting, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per each.
  - 1. Bid Schedule Payment Reference: SP27.4.5.A
  - 2. Bid Schedule Description: Softball Home Plate

### 4.6 SECTION INCLUDES

- A. Softball Pitching Rubber - Includes all labor, materials, and equipment to install softball pitching rubber and turf access box. Includes survey, layout, excavation,

turf box setting, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per each.

1. Bid Schedule Payment Reference: SP27.4.6.A
2. Bid Schedule Description: Softball Pitching Rubber

#### 4.7 SECTION INCLUDES

- A. Inside Turf Baseball Foul Pole - Includes all labor, materials, and equipment to install foul pole and turf box. Includes survey, layout, excavation, footings, foul pole and anchoring system, turf box setting, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per each.
  1. Bid Schedule Payment Reference: SP27.4.7.A
  2. Bid Schedule Description: Baseball Foul Pole w/ Turf Access Box

#### 4.8 SECTION INCLUDES

- A. Outside Turf Baseball Foul Pole - Includes all labor, materials, and equipment to install foul pole. Includes survey, layout, excavation, footings, foul pole and anchoring system, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per each.
  1. Bid Schedule Payment Reference: SP27.4.8.A
  2. Bid Schedule Description: Baseball Foul Pole Outside Turf Mount

#### 4.9 SECTION INCLUDES

- A. Helical Pier Access Box – Includes all labor, materials, and equipment to install access box. Includes survey, layout, excavation, and turf box setting, and all other required incidentals to install completely per plans, details, and specifications. Pay item shall be per each.
  1. Bid Schedule Payment Reference: SP27.4.9.A
  2. Bid Schedule Description: Helical Pier Access Box

### **END OF SECTION**

## **SP-28 - CONSTRUCTION SURVEYING**

### **PART 1 - GENERAL**

#### 1.1 SECTION INCLUDES

##### A. Field Engineering

1. **All construction staking is the responsibility of the Contractor.**
2. All stakes shall be set to the pertinent grades identified on the plans.
3. Upon request, the Engineer will provide the Contractor with the electronic design surface in XML format only and the electronic design geometry drawing in Civild3d 2018 format only.
4. Data conversions to other formats are the responsibility of the contractor.

### **PART 2 - MATERIALS**

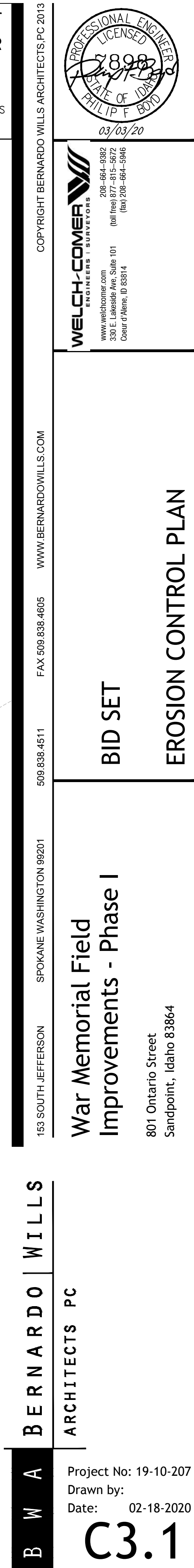
#### 2.1 Not Applicable

### **PART 3 - WORKMANSHIP**

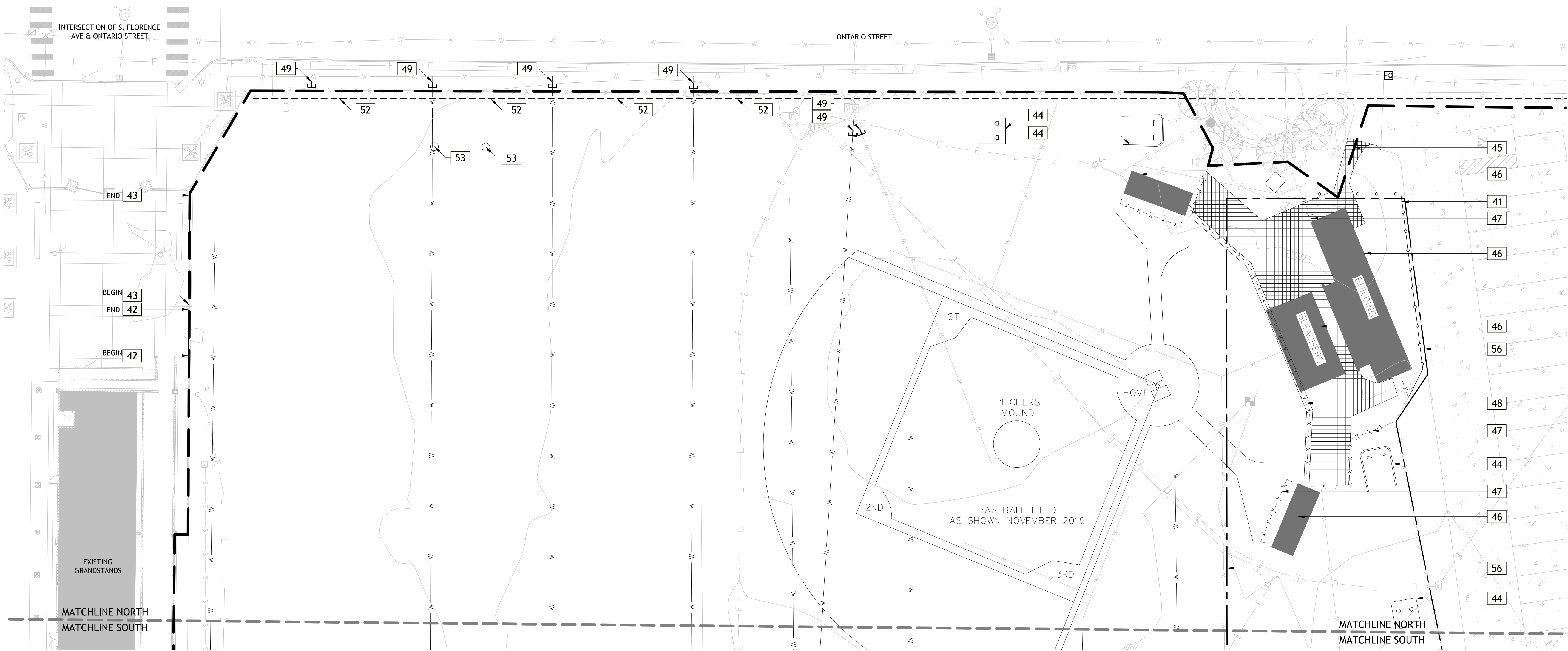
#### 3.1 Not Applicable

### **PART 4 - MEASUREMENT AND PAYMENT**

#### 4.1 Construction Surveying shall be considered incidental to other items.





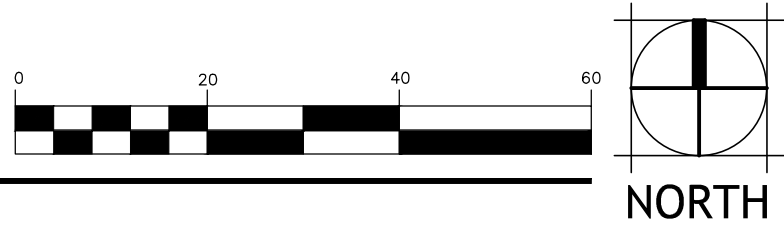


DEMOLITION LEGEND

DEMOLITION NOTES

SYMBOL	DESCRIPTION	QTY		
	39 PROTECT EXISTING CONCRETE FLATWORK IN PLACE	1,005 SF		53 REMOVE EXISTING FOOTBALL FIELD GOALS AND DISPOSE OF PROPERLY OFF-SITE
	40 CUT EXISTING BATTING CAGE POLES AT FOUNDATION. DELIVER POLES TO OWNER AND DEMOLISH REMAINING BATTING CAGE STURCTURE AND FOOTINGS AND DISPOSE OF PROPERLY OFF-SITE	2,794 SF		54 EXISTING VICTORY BELL RESIDUAL DEBRIS TO REMOVE AND DISPOSE OF PROPERLY OFF-SITE
	41 8FT HT. TEMPORARY CHAINLINK CONSTRUCTION FENCE	130 LF		55 APPROXIMATE AREA OF IDENTIFIED UNSUITABLE FILL MATERIALS BASED ON GEOTECHNICAL REPORT. ANY DEBRIS ENCOUNTERED SHALL BE INCLUDED AS INCIDENTAL TO THE PROJECT. 24,050 SF
	42 SAWCUT & REMOVE (12" WIDE BAND OF EXISTING CONCRETE TO ALLOW FOR NEW SYNTHETIC TURF CONCRETE EDGE TYPE VII. SALVAGE EXISTING BOLLARDS FOR RE-USE	19 LF		56 APPROXIMATE LIMITS OF CONTRACTOR STAGING AREA
	43 SAWCUT & REMOVE (12" WIDE BAND OF EXISTING ASPHALT TO ALLOW FOR NEW SYNTHETIC TURF CONCRETE EDGE TYPE VII. SALVAGE EXISTING BOLLARDS FOR RE-USE	43 LF	<i>* ALL QUANTITIES PROVIDED SHALL BE CONFIRMED BY CONTRACTOR AND ARE SHOWN FOR REFERENCE ONLY. IN THE CASE OF A DISCREPANCY BETWEEN THE SCHEDULE AND PLAN, THE PLAN LOCATION(S) SHALL DICTATE QUANTITY.*</i>	
	44 REMOVE EXISTING WARM UP AMENITIES			
	45 REMOVE EXISTING CONCRETE FLATWORK	2,476 SF		
	46 REMOVE EXISTING STRUCTURE & ANY ASSOCIATED FOOTINGS			
	47 REMOVE EXISTING CHAINLINK FENCE			
	48 REMOVE EXISTING BACKSTOP FENCING & CONCRETE WALL/FOOTING			
	49 REMOVE & CAP EXISTING IRRIGATION LINES, TYP.			
	50 APPROXIMATE PROJECT EXTENTS LIMIT LINE. SEE SHEET C3.1.	1,840 LF		
	52 EXISTING UNDERGROUND AVISTA PRIMARY POWER LINE. FIELD VERIFY AND PROTECT			

- CONTRACTOR SHALL MAINTAIN THE CONSTRUCTION SITE IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL HEALTH AND SAFETY STANDARDS FOR THE DURATION OF CONSTRUCTION.
- CONTRACTOR TO FIELD VERIFY WITH OWNER'S REPRESENTATIVE ALL DIMENSIONS, SITE ELEVATIONS, PROPERTY LINES AND DEMO EXTENTS PRIOR TO THE COMMENCEMENT OF WORK. THE LANDSCAPE ARCHITECT IS TO BE NOTIFIED IMMEDIATELY OF ANY ERRORS, INCONSISTENCIES OR OMISSIONS ON THE PLANS OR SPECIFICATIONS PRIOR TO COMMENCEMENT OF WORK IN THE AFFECTED WORK AREA.
- CONTRACTOR IS RESPONSIBLE FOR ALL MEANS AND METHODS OF FIELD AND SITE CONSTRUCTION PER CONTRACT DOCUMENTS.
- CONTRACTOR SHALL REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- VERIFY LOCATION OF ALL UTILITIES PRIOR TO INITIATION OF ANY DEMOLITION OR CONSTRUCTION OPERATIONS. ANY DAMAGE TO EXISTING UTILITIES ON-SITE OR ADJACENT PROPERTY SHALL BE CONTRACTOR'S RESPONSIBILITY TO CORRECT.
- ALL TURF AREAS IMPACTED BY DEMOLITION OR CONSTRUCTION SHALL BE REPAIRED. TOP DRESS WITH APPROVED TOPSOIL AND MATCH EXISTING ADJACENT GRADES. INSTALL NEW TURF PER PLANTING PLAN(S) AND SPECIFICATIONS.
- PROTECT ALL EXISTING IRRIGATION TO REMAIN.
- CONTRACTOR SHALL MAINTAIN IRRIGATION TO EXISTING LANDSCAPE TO REMAIN AND KEEP OPERABLE THROUGHOUT THE DURATION OF CONSTRUCTION. ANY DAMAGE SHALL BE REPAIRED WITHIN 48 HRS. TO PREVENT DAMAGE OR LOSS TO EXISTING LANDSCAPE.
- IN THE EVENT OF A DISCREPANCY, IMMEDIATELY NOTIFY LANDSCAPE ARCHITECT.
- CONTRACTOR TO REMOVE EXISTING UNDERGROUND LIGHTING COMPONENTS WITHIN AREAS OF DEMOLITION. PROTECT CIRCUITING AT DEMOLITION LIMITS FOR EXTENSIONS TO NEW LIGHTING LOCATIONS.
- CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY DAMAGE TO/OR DEFACING OF NEW OR EXISTING CONCRETE FLATWORK, ASPHALT, TURF AREAS, AND ANY OTHER EXISTING OR NEW SITE ELEMENTS AS A RESULT OF CONSTRUCTION ACTIVITIES.
- WASHOUT AREA SHALL NOT BE LOCATED NEAR OR DRAINING INTO A STORM DRAINAGE AREA. TREATMENT AREA OR FACILITY.
- CONTRACTOR TO MAINTAIN EMERGENCY VEHICLE ACCESS TO ALL AREAS ON-SITE DURING CONSTRUCTION.
- CONTRACTOR SHALL MAINTAIN A CLEAN & ORDERLY CONSTRUCTION WORK AREA AND SHALL CONTROL DUST AND EROSION IN ACCORDANCE WITH STANDARD PRACTICE.
- UTILITIES ARE APPROXIMATE. COORDINATE WITH OWNER'S REPRESENTATIVE.
- SEE ELECTRICAL DEMOLITION PLAN SHEET E1.1 AND CIVIL DEMOLITION PLAN SHEET D1.1.



STATE OF IDAHO  
JAMES R. HATCH  
LANDSCAPE ARCHITECT  
LA-140  
02-18-20

COPYRIGHT BERNARDO WILLS ARCHITECTS, PC 2013  
WWW.BERNARDOWILLS.COM  
509.838.4511  
FAX 509.838.4605  
SPOKANE WASHINGTON 99201  
163 SOUTH JEFFERSON

B W A  
BERNARDO WILLS  
ARCHITECTS PC

WAR MEMORIAL FIELD  
IMPROVEMENTS - PHASE I

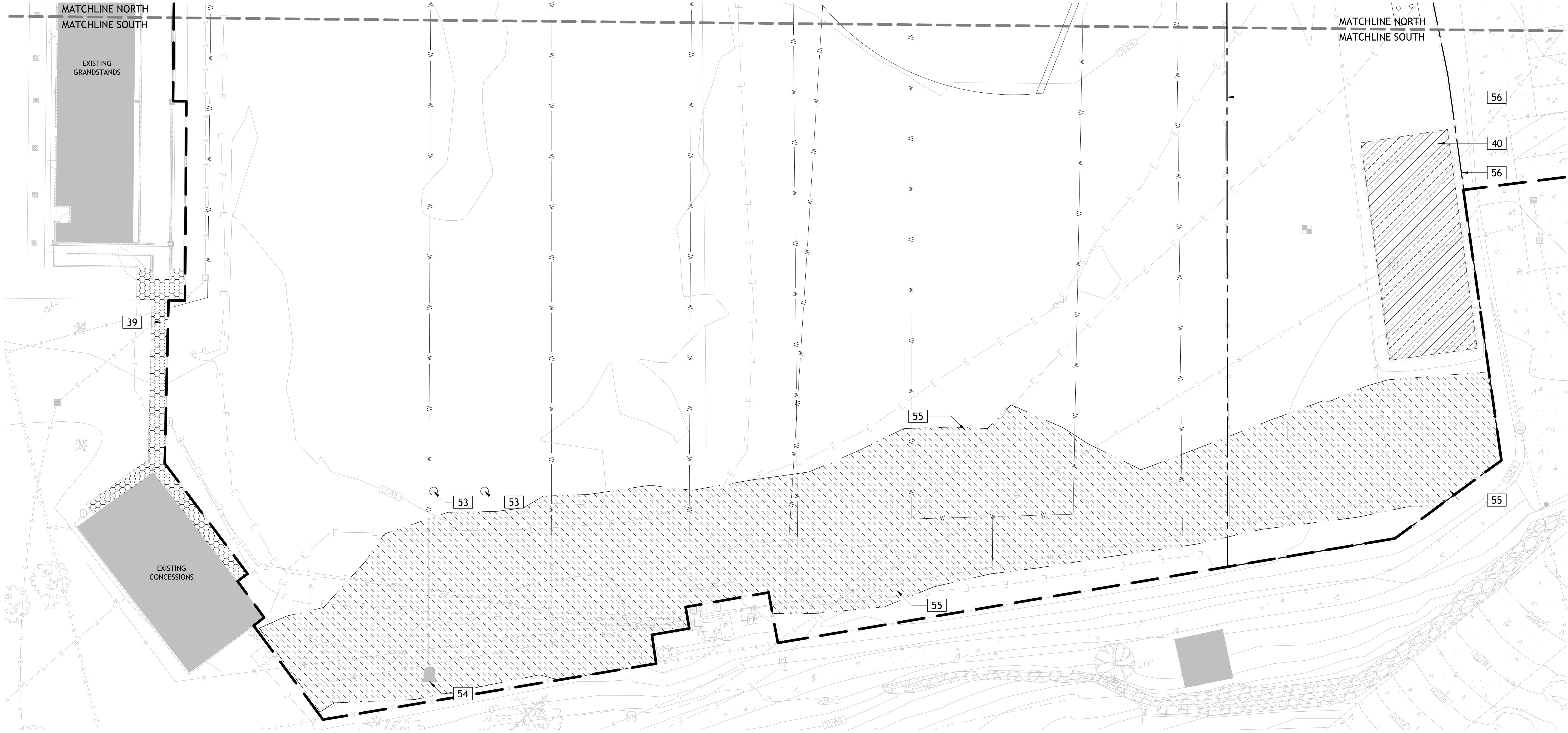
801 Ontario Street  
Sandpoint, Idaho 83864

BID SET  
DEMOLITION PLAN  
NORTH

Project No: 19-10-207  
Drawn by:  
Date: 02-18-2020  
L0.0



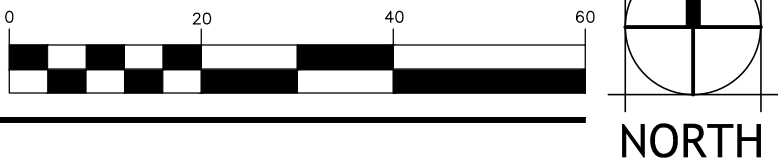
DEMOLITION LEGEND					
SYMBOL	DESCRIPTION	QTY			
	39 PROTECT EXISTING CONCRETE FLATWORK IN PLACE	1,005 SF		49 REMOVE & CAP EXISTING IRRIGATION LINES, TYP.	
	40 CUT EXISTING BATTING CAGE POLES AT FOUNDATION. DELIVER POLES TO OWNER AND DEMOLISH REMAINING BATTING CAGE STURCTURE AND FOOTINGS AND DISPOSE OF PROPERLY OFF-SITE	2,794 SF		50 APPROXIMATE PROJECT EXTENTS LIMIT LINE. SEE SHEET C3.1.	1,840 LF
	41 8FT HT. TEMPORARY CHAINLINK CONSTRUCTION FENCE	130 LF		52 EXISTING UNDERGROUND AVISTA PRIMARY POWER LINE. FIELD VERIFY AND PROTECT	
	42 SAWCUT & REMOVE (12") WIDE BAND OF EXISTING CONCRETE TO ALLOW FOR NEW SYNTHETIC TURF CONCRETE EDGE TYPE VII. SALVAGE EXISTING BOLLARDS FOR RE-USE	19 LF		53 REMOVE EXISTING FOOTBALL FIELD GOALS AND DISPOSE OF PROPERLY OFF-SITE	
	43 SAWCUT & REMOVE (12") WIDE BAND OF EXISTING ASPHALT TO ALLOW FOR NEW SYNTHETIC TURF CONCRETE EDGE TYPE VII. SALVAGE EXISTING BOLLARDS FOR RE-USE	43 LF		54 EXISTING VICTORY BELL RESIDUAL DEBRIS TO REMOVE AND DISPOSE OF PROPERLY OFF-SITE	
	44 REMOVE EXISTING WARM UP AMENITIES			55 APPROXIMATE AREA OF IDENTIFIED UNSUITABLE FILL MATERIALS BASED ON GEOTECHNICAL REPORT. ANY DEBRIS ENCOUNTERED SHALL BE INCLUDED AS INCIDENTAL TO THE PROJECT.	24,050 SF
	45 REMOVE EXISTING CONCRETE FLATWORK	2,476 SF		56 APPROXIMATE LIMITS OF CONTRACTOR STAGING AREA	
	46 REMOVE EXISTING STRUCTURE & ANY ASSOCIATED FOOTINGS		* ALL QUANTITIES PROVIDED SHALL BE CONFIRMED BY CONTRACTOR AND ARE SHOWN FOR REFERENCE ONLY. IN THE CASE OF A DISCREPANCY BETWEEN THE SCHEDULE AND PLAN, THE PLAN LOCATION(S) SHALL DICTATE QUANTITY.*		
	47 REMOVE EXISTING CHAINLINK FENCE				
	48 REMOVE EXISTING BACKSTOP FENCING & CONCRETE WALL/FOOTING				



1

DEMOLITION PLAN (SOUTH)

SCALE: 1" = 20'-0" @ 22"x34" (FULL SIZE) | 1" = 40'-0" @ 11"x17" (HALF SIZE)



UNDERGROUND SERVICE ALERT  
ONE-CALL NUMBER  
811 OR  
(800)342-1585  
CALL TWO BUSINESS DAYS BEFORE YOU DIG

Project No: 19-10-207  
Drawn by:  
Date: 02-18-2020

L0.1

B  
W  
A

BERNARDO WILLS  
ARCHITECTS PC

133 SOUTH JEFFERSON  
SPOKANE WASHINGTON 99201  
509.838.4511  
FAX 509.838.4605  
WWW.BERNARDOWILLS.COM

War Memorial Field  
Improvements - Phase I

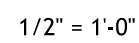
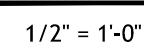
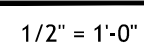
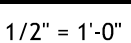
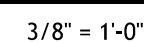
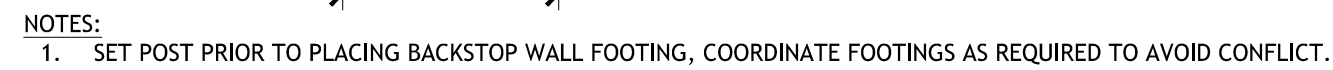
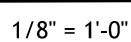
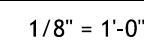
801 Ontario Street  
Sandpoint, Idaho 83864

BID SET  
DEMOLITION PLAN  
SOUTH

STATE OF IDAHO  
JAMES R. HATCH  
LANDSCAPE ARCHITECT  
02-18-20

COPYRIGHT BERNARDO WILLS ARCHITECTS PC 2013







SYMBOLS LEGEND	
SYMBOL	DESCRIPTION
	SHEET NOTE
	CONDUIT, VERTICAL TRANSITION
	CONDUIT CAPPED
	HOME RUN X = PANELBOARD # = BRANCH CIRCUIT NUMBER(S)
	JUNCTION BOX
	SURFACE RACEWAY (DEVICES SHOWN)
	FLUSH FLOOR BOX (DEVICES SHOWN)
	POWER POLE
	VAULT
	TRANSFORMER
	CURRENT TRANSFORMER
	NORMALLY OPEN CONTACTOR
	NORMALLY CLOSED CONTACTOR
	CIRCUIT BREAKER NUMBER INDICATES TRIP AND POLES
	DISCONNECT SWITCH
	FUSE WITH RATING
	FUSED DISCONNECT WITH RATING
	MOTOR THERMAL OVERLOADS
	GROUND CONNECTION
	AUTOMATIC TRANSFER SWITCH
	POWER METER
	RELAY
	VARIABLE FREQUENCY DRIVE
	FEEDER CALLOUT
	LUMINAIRE: ID = FIXTURE TYPE x = SWITCH ASSOCIATION
	2'x4' RECESSED LUMINAIRE
	1'x4' RECESSED LUMINAIRE
	1'x4' SURFACE MTD LUMINAIRE
	PENDANT-MTD/SUSPENDED LUMINAIRE
	WALL-MTD FLUORESCENT LUMINAIRE
	STRIP LIGHTING LUMINAIRE
	CEILING-MTD DIRECTIONAL LUMINAIRE
	CEILING-MTD LUMINAIRE
	TRACK LIGHT WITH NUMBER OF HEADS SHOWN
	WALL-MTD LUMINAIRE
	EXIT SIGN WITH ARROW INDICATING DIRECTION OF EGRESS
	WALL-MTD EXIT SIGN
	CEILING-MTD EXIT SIGN
	BATTERY POWERED EMERGENCY LIGHT
	SINGLE-POLE WALL SWITCH
	PHOTOCELL CONTROL
	OCCUPANCY SENSOR
	LIGHTING CONTROL PANEL

SYMBOLS LEGEND	
SYMBOL	DESCRIPTION
	WALL SWITCH: X = AS FOLLOWS: 3 - THREE-WAY 4 - FOUR-WAY D - DIMMER K - KEY-OPERATED LV2B - LOW-VOLTAGE 2 BUTTON LV4B - LOW-VOLTAGE 4 BUTTON LVD - LOW-VOLTAGE DIMMER LV2D - LOW-VOLTAGE OCCUPANCY DIMMING LV-OD - LOW VOLTAGE OCCUPANCY DIMMING LV-OS - LOW-VOLTAGE OCCUPANCY SENSING VS - VACANCY SENSING M - MOTOR STARTER WITH OVERLOADS MC- MOMENTARY CONTACT O - OCCUPANCY SENSOR P - PILOT LIGHT WP- WEATHERPROOF a - LOWER-CASE INDICATES SWITCHING CNTRL
	RECEPTACLE OUTLET: X = AS FOLLOWS: C - CLOCK HANGER EP - EXPLOSION PROOF G - GROUND FAULT CIRCUIT INTERRUPT S - SAFETY TYPE T - TIMER CONTROLLED WP- WEATHERPROOF
	DUPLEX RECEPTACLE, 125V, 20A
	DOUBLE-DUPLEX RECEPT, 125V, 20A
	CEILING-MTD DUPLEX RECEPTACLE, 125V, 20A
	CEILING-MTD DOUBLE-DUPLEX RECEPTACLE, 125V, 20A
	SPECIAL PURPOSE RECEPTACLE X = TYPE
	MOTOR CONNECTION
	EQUIPMENT CONNECTION
	DISCONNECT SWITCH
	FLUSH MOUNTED PANELBOARD
	SURFACE MOUNTED PANELBOARD
	480V PANELBOARD
	208V OR 240V PANELBOARD
	TRANSFORMER
	RELAY
	MECHANICAL EQUIPMENT CALLOUT
	DATA/TEL OUTLET, 2-PORTS
	WIRELESS ACCESS POINT
	DOOR CONTACT
	CARD READER
	KEYPAD
	SECURITY MONITOR
	CCTV SECURITY VIDEO CAMERA
	SPEAKER VR- VANDAL RESISTANT
	WALL-MOUNTED SPEAKER
	INTERCOM AUDIO MUSIC SOURCE
	CLOCK
	PUSH BUTTON
	SMOKE DETECTOR
	HEAT DETECTOR
	FIRE ALARM MANUAL PULL STATION
	FIRE ALARM HORN STROBE - WALL MOUNTED
	FIRE ALARM HORN STROBE - CEILING MOUNTED
	FIRE ALARM ANNUNCIATOR PANEL
	FIRE ALARM CONTROL PANEL

ELECTRICAL GENERAL NOTES	
THE FOLLOWING GENERAL NOTES APPLY TO ALL DRAWINGS	
1.	REFER TO SPECIFICATIONS AND ALL OTHER DIVISION DOCUMENTS FOR ADDITIONAL REQUIREMENTS.
2.	ELECTRICAL CONTRACTOR SHALL COORDINATE WORK WITH OTHER TRADES.
3.	ALL MATERIALS SHALL BE NEW AND SHALL BE LISTED BY UNDERWRITER'S LABORATORIES, INC.
4.	CATALOG NUMBERS USED IN SYMBOLS LIST AND FIXTURE SCHEDULE ARE TO BE AS NOTED OR APPROVED EQUALS. MAINTAIN SPECIFIED GRADE.
5.	IT IS THE INTENT OF THE ELECTRICAL CONTRACT DOCUMENTS THAT ALL ELECTRICAL SYSTEMS ARE INSTALLED COMPLETE, TESTED AND READY FOR OPERATION, UNLESS SPECIFICALLY NOTED OTHERWISE AND WHETHER OR NOT EVERY ITEM OF EQUIPMENT, DEVICE, BOX, ETC. IS SHOWN ON THE PLANS. ELECTRICAL SUBCONTRACTOR SHALL BE ON THE PREMISES OPENING DAY.
6.	LOCATIONS OF ALL DEVICES ARE SHOW SCHEMATICALLY. COORDINATE WITH THE ARCHITECTURAL DRAWINGS, REFLECTED CEILING PLANS, ELEVATIONS AND CASEWORK. SUPPLIER'S SHOP DRAWINGS FOR EXACT LOCATION PRIOR TO ROUGH-IN. WHERE OUTLET GROUPINGS OCCUR, MOUNT BOXES AS CLOSE TO EACH OTHER AS PRACTICAL. OUTLETS SHALL NOT BE MOUNTED BACK TO BACK ON THE SAME WALL, BUT WILL HAVE MINIMUM LATERAL SEPARATION OF 12" OR (1) STUD SPACE. CONNECT OUTLETS WITH FLEX STEEL CONDUIT. ON FIRE WALLS SEPARATION MUST BE 24".
7.	SEAL ALL PENETRATIONS IN RATED WALLS, FLOORS AND CEILINGS WITH A UL APPROVED FIRE STOP SYSTEM.
8.	PROVIDE A 220 LB NYLON JET PUL STRING IN ALL EMPTY RACEWAYS.
9.	PROVIDE EMT RACEWAY FOR WIRING RUNNING THROUGH WALLS, FLOOR, AND CEILINGS. ALL WIRING AND CABLING NOT INSTALLED IN METALLIC RACEWAYS SHALL BE PLENUM RATED.
10.	ALL CONDUIT AND RACEWAY SHALL BE RUN CONCEALED UNLESS NOTED OTHERWISE AND SHALL BE RUN PARALLEL OR PERPENDICULAR TO STRUCTURAL MEMBERS, WALLS, CEILINGS, OR FLOORS. NO STRUCTURAL MEMBER SHALL BE CUT OR ALTERED WITHOUT PRIOR APPROVAL OF THE ARCHITECT AND STRUCTURAL ENGINEER.
11.	ALL CONDUIT BELOW CONCRETE SLABS SHALL BE RIGID, HOT-DIPPED GALVANIZED STEEL CONDUIT OR RIGID, CODE APPROVED PVC.
12.	THE INSTALLATION SHALL COMPLY WITH THE 2017 EDITION OF THE NATIONAL ELECTRICAL CODE (NEC), THE STATE OF WASHINGTON ADMINISTRATIVE CODE, THE AUTHORITY HAVING JURISDICTION, AND UTILITY REQUIREMENTS.
13.	THE CONTRACTOR SHALL ENSURE THAT THE ENTIRE ELECTRICAL SYSTEM FOR THIS BUILDING IS GROUNDED IN ACCORDANCE WITH ALL APPLICABLE PROVISIONS OF ARTICLE 250 OF THE N.E.C.
14.	WORKING SPACE ABOUT ELECTRICAL PANELS, SWITCHGEAR, ETC SHALL COMPLY WITH NEC ARTICLE 110.26.
15.	ALL LUMINAIRES SHALL BE SECURELY FASTENED AND IN COMPLIANCE WITH ARTICLE 410-16 OF THE 2008 NEC.
16.	ALL CONDUCTORS SHALL BE COPPER, TYPE THHN/THWN WIRE FOR CONNECTION TO LIGHTING FIXTURES SHALL BE AS REQUIRED BY THE UL LABEL. NO 12 AWG SHALL BE THE MINIMUM SIZE USED FOR POWER WIRING. NO 14 AWG MAY BE USED FOR CONTROL WIRING ONLY. 120 AND 277V CIRCUITS IN EXCESS OF 100' SHALL BE #10 AWG (OR LARGER AS INDICATED) FROM PANEL BOARD TO FIRST OUTLET.
17.	ALL MULTI-WIRE CIRCUITS SHALL BE WIRED SO DEVICES MAY BE REMOVED WITHOUT BREAKING CONTINUITY OF NEUTRAL CONDUCTOR OR ELSE BE ON A COMMON TRIP BREAKER.
18.	PROVIDE UN-SWITCHED PHASE CONDUCTOR TO ALL EXIT SIGNS AND INDICATED LUMINAIRES WITH GENERATOR TRANSFER DEVICES.
19.	PROVIDE ALL EXPANSION FITTINGS, PITCH POCKETS, EQUIPMENT SUPPORTS, AND ACCESS DOORS AS REQUIRED FOR ELECTRICAL WORK.
20.	PROVIDE EQUIPMENT LABELS FOR DISCONNECT SWITCHES, WIRING TROUGHS, ETC. TO IDENTIFY EQUIPMENT OR EQUIPMENT SERVED. LABELS SHALL BE 1/8" THICK OF PHENOLIC MATERIAL, MACHINE ENGRAVED TO EXPOSE CONTRASTING INNER CORE.
21.	MECHANICAL EQUIPMENT POWER CONTROL DEVICES (STARTERS AND COMBINATION STARTERS) AND UNIT DISCONNECTS SHALL BE PROVIDED AND INSTALLED BY THE ELECTRICAL CONTRACTOR UNLESS NOTED OTHERWISE ON THE EQUIPMENT SCHEDULE.
22.	ELECTRICAL CONTRACTOR SHALL PAY ALL UTILITY CONNECTION CHARGES.
23.	ELECTRICAL CONTRACTOR SHALL ARRANGE ALL INSPECTIONS AND PAY ALL FEES. SUBMIT COPY OF FINAL INSPECTION REPORT TO THE OWNER.
24.	NOT ALL LEGEND AND ABBREVIATIONS ARE NECESSARY OR REQUIRED FOR THIS DRAWING SET.
25.	WHERE A CONFLICT EXISTS WITHIN THE DOCUMENTS, THE MOST EXPENSIVE OPTION SHALL GOVERN.
26.	ELECTRICAL CONTRACTOR SHALL TOUR THE PROJECT SITE PRIOR TO BID TO ASSESS EXISTING CONDITIONS, WHICH MAY AFFECT HIS BID. LATER CLAIMS FOR WORK THAT WAS EVENT NOT BE ALLOWED.
27.	ITEMS NOTED AS "TYPICAL" ON ANY DRAWING REFERS TO ALL DRAWINGS.
28.	NO STRUCTURAL MEMBERS SHALL BE CUT OR ALTERED WITHOUT PRIOR APPROVAL OF THE ARCHITECT AND STRUCTURAL ENGINEER.
29.	ALL RACEWAYS WITHIN THE BUILDING SHALL BE RUN OVERHEAD U.O.N. RACEWAYS SHALL NOT BE RUN UNDER THE FLOOR SLAB UNLESS SPECIFICALLY SHOWN ON THE DRAWINGS.
30.	NO RACEWAYS SHALL BE RUN IN FLOOR SLABS.
31.	FIRST FLOOR HOMERUNS (TO THE FIRST DEVICE) MAY BE RUN UNDER THE SLAB IN 1" PVC.
32.	LOCATIONS OF ALL WALL MOUNTED DEVICES ARE SHOWN SCHEMATICALLY. COORDINATE WITH THE ARCHITECTURAL DRAWINGS, ELEVATIONS AND CASEWORK SUPPLIERS SHOP DRAWINGS FOR EXACT LOCATION OF DEVICES PRIOR TO ROUGH-IN.
33.	ALL RACEWAYS IN FINISHED SPACES SHALL BE CONCEALED.
34.	PROVIDE 2" EMT SLEEVES FOR LOW VOLTAGE WIRING RUNNING THROUGH NON-RATED WALLS, FLOORS AND CEILINGS.
35.	PROVIDE ST1 "EZ-PATH" ASSEMBLIES AT EACH LOCATION WHERE LOW VOLTAGE WIRING PENETRATES A RATED WALL OR CEILING. ASSUME 50 ARE TO BE PROVIDED.
36.	PROVIDE A COMPLETE DESIGN-BUILD PATHWAY SYSTEM FOR ALL SPECIAL SYSTEMS WIRING. SEE SPECIFICATIONS. QUANTITY AND SIZE OF RACEWAYS SHOWN ON SPECIAL SYSTEMS PLANS ARE THE MINIMUM TO BE PROVIDED. CONTRACTOR SHALL PROVIDE ALL RACEWAYS AS REQUIRED.
37.	ALL LOW VOLTAGE WIRING NOT RUN IN A METALLIC RACEWAY SHALL BE PLENUM RATED.
38.	ALL EQUIPMENT, LUMINAIRES, RACEWAYS, DEVICES, ETC. SHALL BE UL LISTED.
39.	MOUNT ALL DEVICES ABOVE COUNTERS 6" ABOVE BACKSPASH UNLESS NOTED OTHERWISE.
40.	WHERE A CONFLICT EXISTS THE MOST EXPENSIVE OPTION SHALL GOVERN.
41.	PROVIDE ALL RACEWAYS AND WIRING REQUIRED TO INSTALL ELECTRONIC DOOR HARDWARE. REFER TO DOOR HARDWARE SPECIFICATIONS, SCHEDULES AND DIAGRAMS.

ABBREVIATIONS	
LETTER	NAME
Ø	PHASE
A	ABOVE COUNTER / AMPERE
AFF	ABOVE FINISHED FLOOR
BFC	BELOW FINISHED CEILING
AL	ALUMINUM
AMP	AMPERE
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
B	BELOW COUNTER
BLDG	BUILDING
BOD	BOTTOM OF DEVICE
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CLK	CLOCK
COD	CENTER OF DEVICE
CO	CONDUIT ONLY
COMM	COMMUNICATIONS
CT	CURRENT TRANSFORMER
CU	COPPER
DIA	DIAMETER
DISC	DISCONNECT
DN	DOWN
DW	DISHWASHER
E	EXISTING TO REMAIN
EA	EACH
EGC	EQUIPMENT GROUNDING CONDUCTOR
ELEC	ELECTRIC
ELEV	ELEVATION
EMT	ELECTRICAL METALLIC CONDUIT
ENCL	ENCLOSURE
EQPM	EQUIPMENT
ER	EXISTING TO BE REMOVED
EXP	EXPLOSION PROOF
EXST	EXISTING
FA	FIRE ALARM
FDR	FEEDER
FLA	FULL LOAD AMPERES
FO	FIBER OPTIC
G	GROUND FAULT CIRCUIT INTERRUPT/GROUND
GALV	GALVANIZED
GEN	GENERATOR
GFP	GROUND FAULT PROTECTION
GND	GROUND
HH	HANDHOLE
HP	HORSEPOWER
HZ	HERTZ (CYCLES PER SECOND)
IC	INTERRUPTING CAPACITY
IG	ISOLATED GROUND
IN	INCH / INCHES
JBOX	JUNCTION BOX
KVA	KILO-VOLT-AMPERE
KW	KILOWATT
KWH	KILOWATT-HOUR
LC	LIGHTING CONTROL
MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MECH	MECHANICAL
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MH	MANHOLE
MIN	MINIMUM
MTD	MOUNTED
MW	MICROWAVE
N	NEUTRAL
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL EQUIP. MANUFACTURER'S ASSOC.
NEUT	NEUTRAL
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OC	ON CENTER
OL	OVERLOAD
PB	PULL BOX
PKG	PACKAGE
PNL	PANEL
PWR	POWER
R	EXISTING TO BE RELOCATED
RCPT	RECEPTACLE
REF	REFRIGERATOR
REV	REVISION
RM	ROOM
SHT	SHEET
SIM	SIMILAR
SPD	SURGE PROTECTIVE DEVICE
SPKR	SPEAKER
STBY	STANDBY
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYS	SYSTEM
TBB	TELEPHONE BONDING BACKBONE
TEL	TELEPHONE
THRU	THROUGH
TOD	TOP OF DEVICE
TGB	TELECOMMUNICATIONS GROUND BAR
TMGB	TELECOMMUNICATIONS MAIN GROUND BAR
TV	TELEVISION
TYP	TYPICAL
UG	UNDERGROUND
UH	UNIT HEATER
UPS	UNINTERRUPTIBLE POWER SUPPLY
VFY	VERIFY
VFD	VARIABLE FREQUENCY DRIVE
VR	VANDAL RESISTANT
WP	WEATHERPROOF
XFMR	TRANSFORMER
Z	IMPEDANCE

DEVICE MOUNTING HEIGHTS	
SPECIAL OUTLET HEIGHTS ARE SHOWN ON THE ELECTRICAL DRAWINGS OR ON THE ARCHITECTURAL DRAWINGS. IF SPECIAL OUTLET HEIGHTS ARE NOT SHOWN OR REQUIRED, THEN LOCATE OUTLETS AS NOTED BELOW. OUTLET HEIGHTS ARE MEASURED FROM THE FINISHED FLOOR TO THE CENTERLINE OF THE OUTLET UNLESS OTHERWISE NOTED.	
DEVICE	MOUNTING HEIGHT
RECEPTACLES	18 INCHES VERITCALLY MOUNTED
ABOVE COUNTER ELECTRICAL DEVICES	6" ABOVE COUNTER TO BOTTOM OF DEVICE
LIGHT SWITCHES	48 INCHES VERTICALLY MOUNTED
PANELBOARDS	72 INCHES TO TOP OF PANELBOARD
TELEPHONE OUTLET - DESK	18 INCHES VERTICALLY MOUNTED
TELEPHONE OUTLET - WALL	54 INCHES VERTICALLY MOUNTED
COMPUTER OUTLET - DESK	18 INCHES VERTICALLY MOUNTED
FIRE ALARM PULL STATION	48 INCHES
INTERCOM CALL BUTTON	48 INCHES
DIGITAL CLOCK/SPEAKER	PER ARCHITECTURAL INTERIOR ELEVATIONS
ANALOG CLOCK	PER ARCHITECTURAL INTERIOR ELEVATIONS
CATV OUTLET	18 INCHES VERTICALLY MOUNTED
KEYPAD/CARD READER	48 INCHES
FIRE ALARM HORN, STROBE OR HORN/STROBE	NOT LESS THAN 80" OR GREATER THAN 96" TO THE BOTTOM
FIRE ALARM CONTROL PANEL	72 INCHES
DOOR OPERATOR PUSH BUTTON	48 INCHES OR AS SHOWN ON ARCHITECTURAL ELEVATIONS

SHEET INDEX		
Sheet Number	Sheet Title	
E1.0	ABBREVIATIONS, GENERAL NOTES AND SHEET INDEX	
E1.1	DEMO ELECTRICAL SITE PLAN	
E1.2	ELECTRICAL SITE PLAN	
E1.3	ENLARGED ELECTRICAL SITE PLAN	
E5.1	ELECTRICAL DETAILS	
E6.1	ELECTRICAL SCHEDULES AND ONE-LINES	
E6.2	SCHEDULES	
E8.1	REFERENCE ONLY	
E8.2	REFERENCE ONLY	
E8.3	REFERENCE ONLY	
E8.4	REFERENCE ONLY	
E8.5	REFERENCE ONLY	
E8.6	REFERENCE ONLY	
E8.7	REFERENCE ONLY	
E8.8	REFERENCE ONLY	

**COFFMAN**  
ENGINEERS

1800 F Street  
Anchorage, AK 99501  
ph 907.275.6664  
www.coffman.com

AEC0249

**BID SET**  
ABBREVIATIONS, GENERAL NOTES  
AND SHEET INDEX

War Memorial Field  
Enhancements

Ontario Street  
Sandpoint, Idaho

**B W A**  
ARCHITECTS PC

**BERNARDO WILLS**

Project No: 19-10-207  
Drawn by: ACB  
Date: 02-18-2020

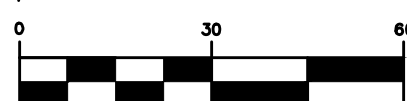
**E1.0**





# ELECTRICAL SITE PLAN

SCALE: 1" = 30'-0"



## GENERAL NOTES

1. ALL WORK SHALL COMPLY WITH THE CURRENT EDITION OF THE NEC AS ADOPTED BY THE STATE OF IDAHO OR THE LOCAL AUTHORITY HAVING JURISDICTION.
2. COORDINATE DEMO AND NEW UTILITY WITH AVISTA UTILITIES:  
ROB SHERRILL (208) 265-6958  
ELECTRICAL CONTRACTOR SHALL PROVIDE TRENCHING, CONDUIT AND BACKFILL FOR ALL NEW AVISTA UTILITY PRIMARY LINES.

## KEY NOTES

1. NEW FIELD LIGHT POLE - PROVIDE NEW POLE, POLE BASE AND LED LUMINAIRE.
2. RELOCATED FIELD LIGHT POLE. PROVIDE NEW POLE BASE PER DETAIL 1 ON SHEET E5.1. REPLACE EXISTING METAL HALIDE LUMINAIRE WITH NEW LED LUMINAIRE FROM MUSCO LIGHTING. SEE SHEET E8.1-4 FOR ADDITIONAL FIELD LIGHT INFORMATION.
3. PROVIDE NEW RECEPTACLE IN A LOCKABLE NEMA 3R ENCLOSURE. SEE ELECTRICAL DETAIL 3 ON SHEET E5.1. PROVIDE A 1" CONDUIT TO ELECTRICAL PANEL N.
4. PROVIDE NEW RECEPTACLE WITH A LOCKABLE NEMA 3R COVER. SEE ELECTRICAL DETAIL 3 ON SHEET E5.1. PROVIDE A 1" CONDUIT TO ELECTRICAL PANEL S. SHOWN ON THE SOUTH SERVICE ELECTRICAL PLAN ON SHEET E1.3
5. PROVIDE NEW RECEPTACLE IN A LOCKABLE NEMA 3R ENCLOSURE. SEE ELECTRICAL DETAIL 2 ON SHEET E5.1. REROUTE TO PANEL N.
6. REPLACE EXISTING METAL HALIDE LUMINAIRE WITH NEW LED LUMINAIRE FROM MUSCO LIGHTING. SEE SHEET E8.1-4 FOR ADDITIONAL FIELD LIGHT INFORMATION.
7. CAP CONDUIT WITH METALLIC CAP. CONDUIT TO BE USED DURING PHASE 2 OF CONSTRUCTION.
8. NOT USED.
9. SAWCUT ACROSS EXISTING ASPHALT TO ROUT CONDUIT . PATCH ASPHALT AFTER CONDUIT IS INSTALLED.
10. NEW OSPREY POLE ROUTE CONDUITS UP POLE TO CONTROL CABINET AND TERMINATE POWER CIRCUIT AND DATA CONNECTION.
11. STUB UP AND CAP CONDUIT AT BASE OF VICTORY BELL FOR FUTURE USE.
12. PROVIDE NEW RECEPTACLE IN A LOCKABLE NEMA 3R ENCLOSURE. SEE ELECTRICAL DETAIL 2 ON SHEET E5.1. REROUTE TO PANEL S.
13. PROVIDE A CARSON 1027 HANDHOLE OR APPROVED EQUAL WITH LOCKING HDPE COVER.
14. INTERCEPT EXISTING COMMUNICATION CONDUITS TO OSPREY NEST POLE AND LIBERTY BELL.
15. PROVIDE A NEW WALL MOUNTED DATA RACK. CHATSWORTH# 25504-712 OR APPROVED.
16. PROVIDE AN OLDCASTLE DURALITE 1015 HANDHOLE OR APPROVED EQUAL WITH A FLUSH SLOD POLYMER CONCRETE COVER. HAND HOLE SHALL SIT FLUSH IN CONCRETE SIDEWALK.





Memorial Field Retrofit

Sandpoint, ID

Lighting System

Pole / Fixture Summary						
Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Circuit
A1	70'	70'	5	TLC-LED-1200	5.85 kW	B
		16'	1	TLC-BT-575	0.58 kW	A
A2	70'	70'	3	TLC-LED-1200	3.51 kW	B
A3	90'	90'	7	TLC-LED-1500	10.01 kW	A
		16'	2	TLC-BT-575	1.15 kW	A
B1	90'	90'	8	TLC-LED-1500	11.44 kW	A
		16'	1	TLC-BT-575	0.58 kW	A
B2	90'	90'	7	TLC-LED-1500	10.01 kW	A
		90'	1	TLC-LED-900	0.89 kW	A
F1	80'	16'	2	TLC-BT-575	1.15 kW	A
		80'	7	TLC-LED-1200	8.19 kW	A
		80'	1	TLC-LED-600	0.58 kW	A
F2	80'	16'	2	TLC-BT-575	1.15 kW	A
		80'	8	TLC-LED-1200	9.36 kW	A
		16'	2	TLC-BT-575	1.15 kW	A
7			57		65.59 kW	

Circuit Summary			
Circuit	Description	Load	Fixture Qty
A	Football	56.23 kW	49
B	Baseball	9.36 kW	8

Fixture Type Summary							
Type	Source	Wattage	Lumens	L90	L80	L70	Quantity
TLC-LED-1200	LED 5700K - 75 CRI	1170W	136,000	>81,000	>81,000	>81,000	23
TLC-LED-1500	LED 5700K - 75 CRI	1430W	160,000	>81,000	>81,000	>81,000	22
TLC-LED-600	LED 5700K - 75 CRI	580W	65,600	>81,000	>81,000	>81,000	1
TLC-LED-900	LED 5700K - 75 CRI	890W	89,600	>81,000	>81,000	>81,000	1
TLC-BT-575	LED 5700K - 75 CRI	575W	52,000	>81,000	>81,000	>81,000	10

Light Level Summary

Calculation Grid Summary									
Grid Name	Calculation Metric	Illumination					Circuits	Fixture Qty	
		Ave	Min	Max	Max/Min	Ave/Min			
Baseball 1st Base Bullpen	Horizontal	13.4	9.30	21	2.26	1.44	A,B	57	
Baseball 3rd Base Bullpen	Horizontal	26.2	18.2	34.1	1.88	1.44	A,B	57	
Baseball (Infield)	Horizontal Illuminance	56.3	44.8	65.4	1.46	1.26	A,B	57	
Baseball (Outfield)	Horizontal Illuminance	39.9	27.8	56	2.02	1.44	A,B	57	
Football	Horizontal Illuminance	35.9	26.9	43.8	1.63	1.33	A	49	
Softball 1st Base Bullpen	Horizontal	16.1	11.5	22	1.91	1.40	A,B	57	
Softball (Infield)	Horizontal Illuminance	50.3	39.9	60	1.50	1.26	A,B	57	
Softball (Outfield)	Horizontal Illuminance	43.2	27.7	55.7	2.01	1.56	A,B	57	

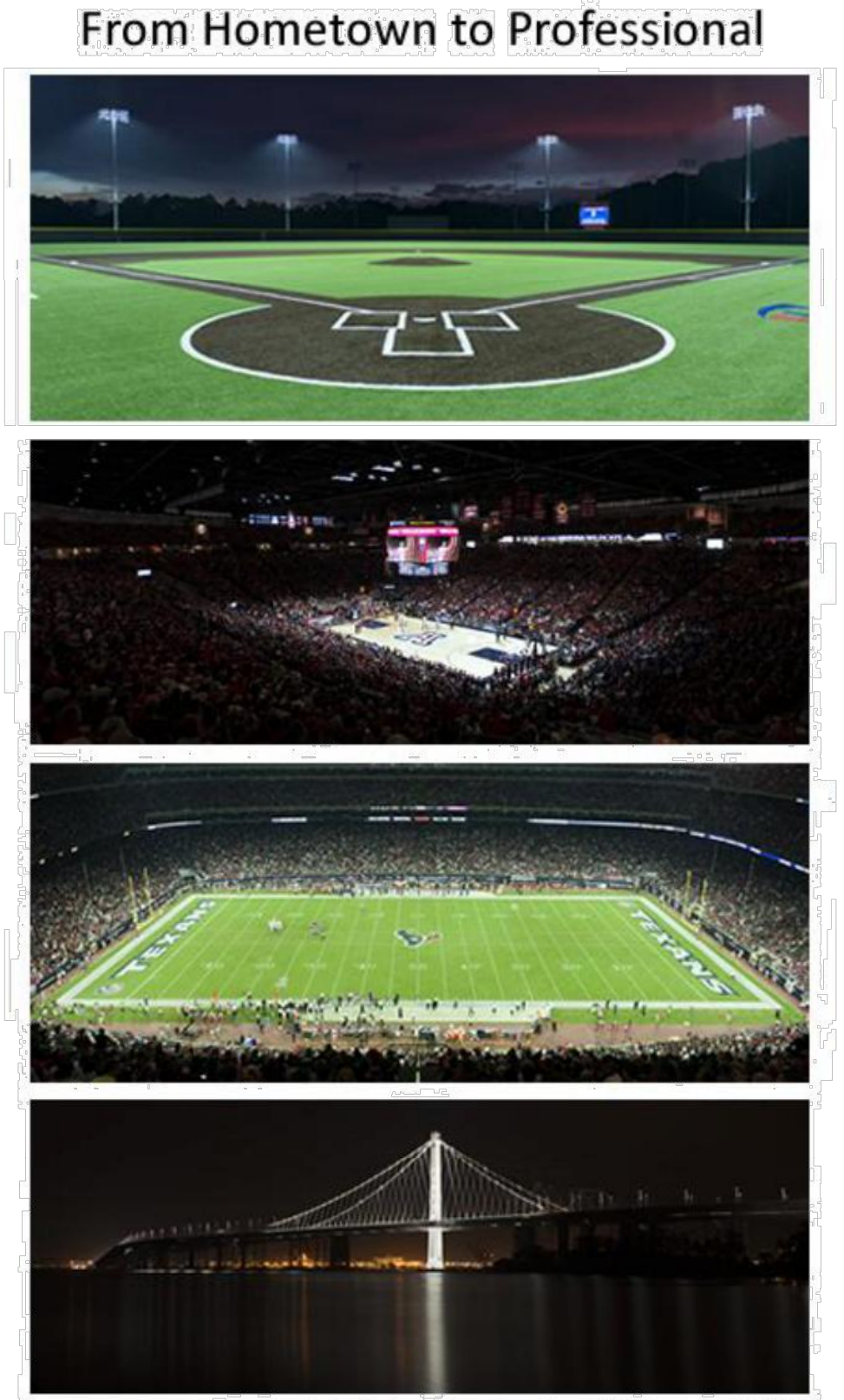


We Make It Happen®

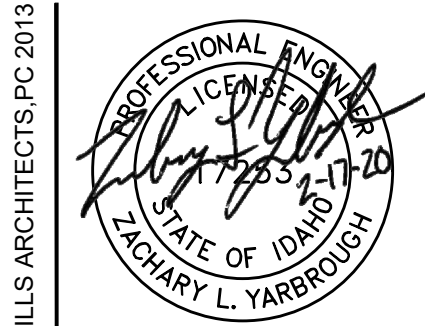
Not to be reproduced in whole or part without the written consent of Musco Sports Lighting, LLC. ©1981, 2020 Musco Sports Lighting, LLC.

ENGINEERED DESIGN By: Zach Morris • File #203056D • 26-Feb-20

PROJECT SUMMARY



From Hometown to Professional



COFFMAN ENGINEERS  
1800 F Street  
Anchorage, AK 99501  
ph 907.275.6664  
www.coffman.com

AEC0249

COPYRIGHT BERNARDO WILLS ARCHITECTS PC 2013

WWW.BERNARDOWILLS.COM

FAX 509.838.4605

509.838.4511

SPOKANE WASHINGTON 99201

163 SOUTH JEFFERSON

BERNARDO WILLS

ARCHITECTS PC

War Memorial Field Enhancements

Ontario Street  
Sandpoint, Idaho

BID SET

REFERENCE ONLY

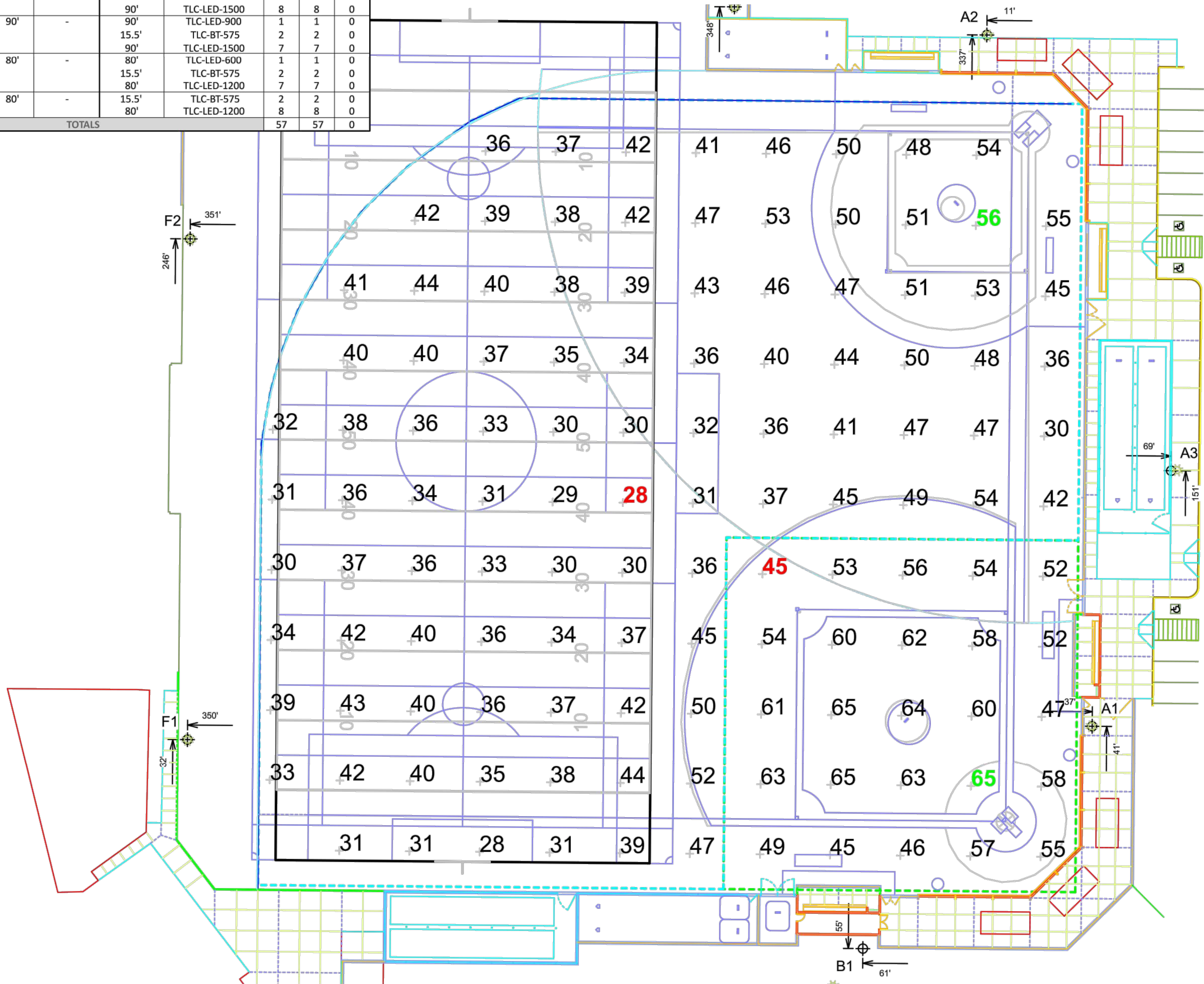
B W A

Project No: 19-10-207  
Drawn by: ACB  
Date: 02-18-2020

E8.1



EQUIPMENT LIST FOR AREAS SHOWN									
Pole				Luminaires					
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS	
1	A1	70'	-	15.5'	TLC-BT-575	1	1	0	
				70'	TLC-LED-1200	5	5	0	
1	A2	70'	-	70'	TLC-LED-1200	3	3	0	
1	A3	90'	-	15.5'	TLC-BT-575	2	2	0	
				90'	TLC-LED-1500	7	7	0	
1	B1	90'	-	15.5'	TLC-BT-575	1	1	0	
				90'	TLC-LED-1500	8	8	0	
1	B2	90'	-	90'	TLC-LED-900	1	1	0	
				15.5'	TLC-BT-575	2	2	0	
				90'	TLC-LED-1500	7	7	0	
1	F1	80'	-	80'	TLC-LED-600	1	1	0	
				15.5'	TLC-BT-575	2	2	0	
				80'	TLC-LED-1200	7	7	0	
1	F2	80'	-	15.5'	TLC-BT-575	2	2	0	
				80'	TLC-LED-1200	8	8	0	
7	TOTALS					57	57	0	



## Memorial Field Retrofit

Sandpoint, ID

GRID SUMMARY	
Name:	Baseball
Size:	Irregular 320' / 379' / 307'
Spacing:	30.0' x 30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY		
MAINTAINED HORIZONTAL FOOTCANDLES		
	Infield	Outfield
Guaranteed Average:	50	30
Scan Average:	56.3	39.9
Maximum:	65.4	56.0
Minimum:	44.8	27.8
Avg / Min:	1.26	1.44
Guaranteed Max / Min:	2	2.5
Max / Min:	1.46	2.02
UG (adjacent pts):	1.44	1.59
CU:	0.67	
No. of Points:	25	98
LUMINAIRE INFORMATION		
Color / CRI:	5700K - 75 CRI	
Luminaire Output:	136,000 / 160,000 / 65,600 / 89,600 / 52,000 lumen	
No. of Luminaires:	57	
Total Load:	65.59 kW	

Lumen Maintenance			
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1200	>81,000	>81,000	>81,000
TLC-LED-1500	>81,000	>81,000	>81,000
TLC-LED-600	>81,000	>81,000	>81,000
TLC-LED-900	>81,000	>81,000	>81,000
TLC-BT-575	>81,000	>81,000	>81,000

Reported per TM-21-11. See luminaire datasheet for details.

**Guaranteed Performance:** The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

**Field Measurements:** Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

**Electrical System Requirements:** Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

**Installation Requirements:** Results assume  $\pm$  3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

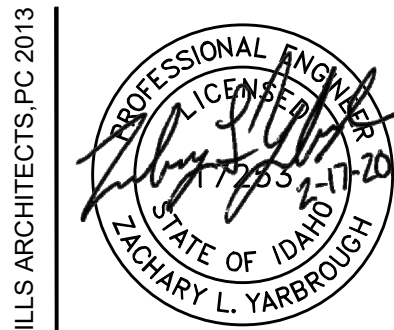


Not to be reproduced in whole or part without the written consent of Musco Sports Lighting, LLC. ©1981, 2020 Musco Sports Lighting, LLC.

## ILLUMINATION SUMMARY



ENGINEERED DESIGN By: Zach Morris • File #203056D • 26-Feb-20



COPYRIGHT BERNARDO WILLS ARCHITECTS PC 2013

WWW.BERNARDOWILLS.COM

FAX 509.838.4605

509.838.4511

SPOKANE WASHINGTON 99201

163 SOUTH JEFFERSON

BERNARDO WILLS

ARCHITECTS PC

Project No: 19-10-207  
Drawn by: ACB  
Date: 02-18-2020

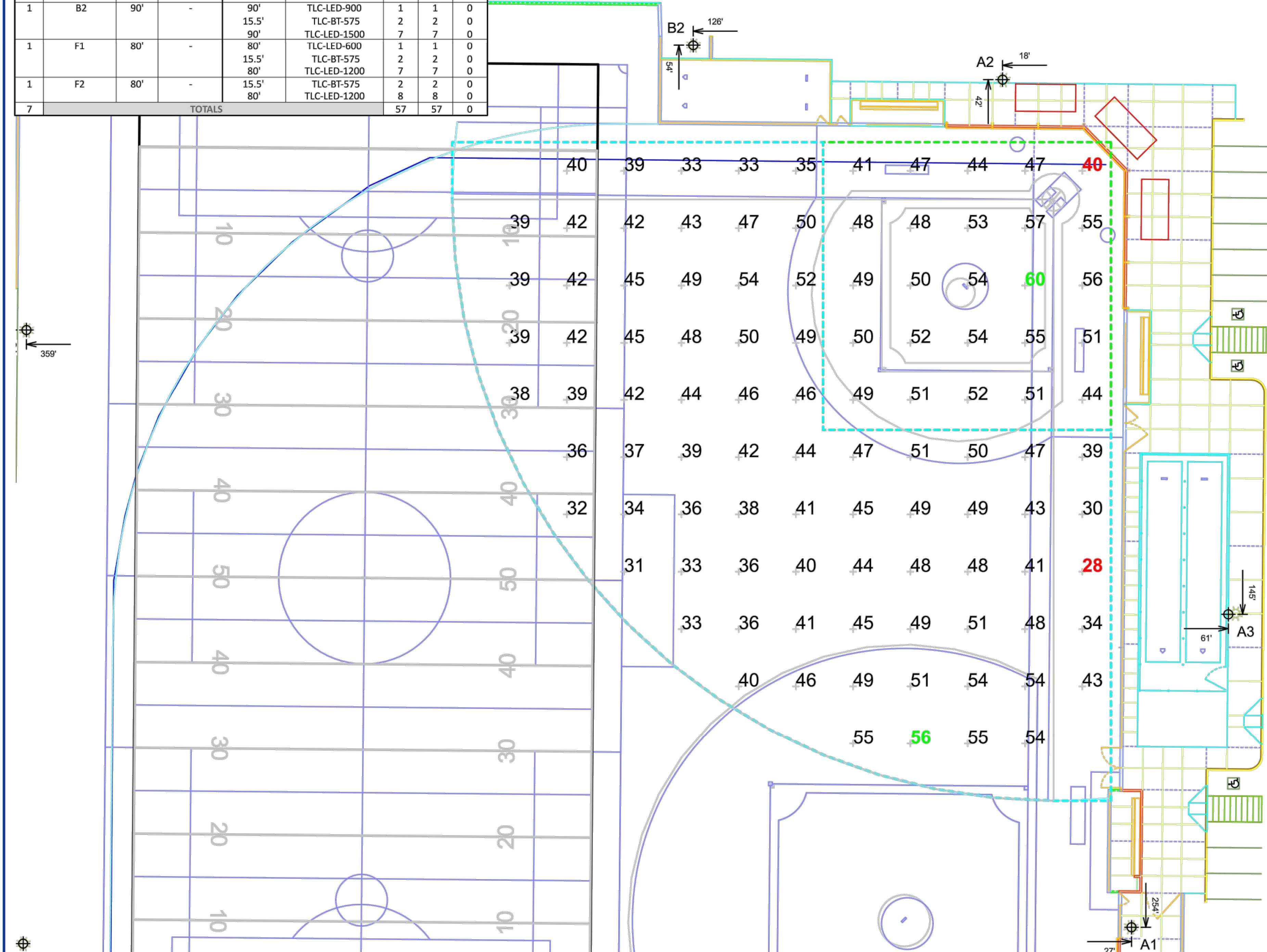
E8.2

BID SET  
REFERENCE ONLY

War Memorial Field  
Enhancements  
Ontario Street  
Sandpoint, Idaho



EQUIPMENT LIST FOR AREAS SHOWN									
Pole				Luminaires					
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS	
1	A1	70'	-	15.5'	TLC-BT-575	1	1	0	
				70'	TLC-LED-1200	5	5	0	
1	A2	70'	-	70'	TLC-LED-1200	3	3	0	
1	A3	90'	-	15.5'	TLC-BT-575	2	2	0	
				90'	TLC-LED-1500	7	7	0	
1	B1	90'	-	15.5'	TLC-BT-575	1	1	0	
				90'	TLC-LED-1500	8	8	0	
1	B2	90'	-	90'	TLC-LED-900	1	1	0	
				15.5'	TLC-BT-575	2	2	0	
				90'	TLC-LED-1500	7	7	0	
1	F1	80'	-	80'	TLC-LED-600	1	1	0	
				15.5'	TLC-BT-575	2	2	0	
				80'	TLC-LED-1200	7	7	0	
1	F2	80'	-	15.5'	TLC-BT-575	2	2	0	
				80'	TLC-LED-1200	8	8	0	
7	TOTALS					57	57	0	



## Memorial Field Retrofit

Sandpoint,ID

GRID SUMMARY	
Name:	Softball
Size:	210'/210'/210' - basepath 60'
Spacing:	20.0' x 20.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY		
MAINTAINED HORIZONTAL FOOTCANDLES		
	Infield	Outfield
Guaranteed Average:	50	30
Scan Average:	50.3	43.2
Maximum:	60.0	55.7
Minimum:	39.9	27.7
Avg / Min:	1.26	1.56
Guaranteed Max / Min:	2	2.5
Max / Min:	1.50	2.01
UG (adjacent pts):	1.38	1.49
CU:	0.26	
No. of Points:	25	77
LUMINAIRE INFORMATION		
Color / CRI:	5700K - 75 CRI	
Luminaire Output:	136,000 / 160,000 / 65,600 / 89,600 / 52,000 lumen	
No. of Luminaires:	57	
Total Load:	65.59 kW	

Reported per TM-21-11. See luminaire datasheet for details.			
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1200	>81,000	>81,000	>81,000
TLC-LED-1500	>81,000	>81,000	>81,000
TLC-LED-600	>81,000	>81,000	>81,000
TLC-LED-900	>81,000	>81,000	>81,000
TLC-BT-575	>81,000	>81,000	>81,000

**Guaranteed Performance:** The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

**Field Measurements:** Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

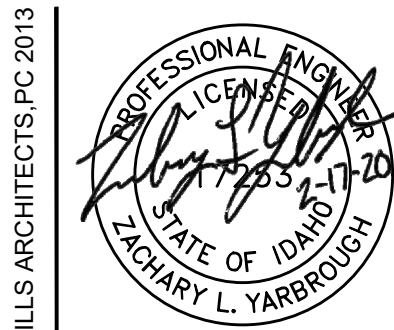
**Electrical System Requirements:** Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

**Installation Requirements:** Results assume  $\pm$  3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



Not to be reproduced in whole or part without the written consent of Musco Sports Lighting, LLC. ©1981, 2020 Musco Sports Lighting, LLC.

## ILLUMINATION SUMMARY



153 SOUTH JEFFERSON SPOKANE WASHINGTON 99201 509.838.4511 FAX 509.838.4605 WWW.BERNARDOWILLS.COM

BERNARDO WILLS

A

W

B

ARCHITECTS PC

War Memorial Field Enhancements

Ontario Street Sandpoint, Idaho

BID SET

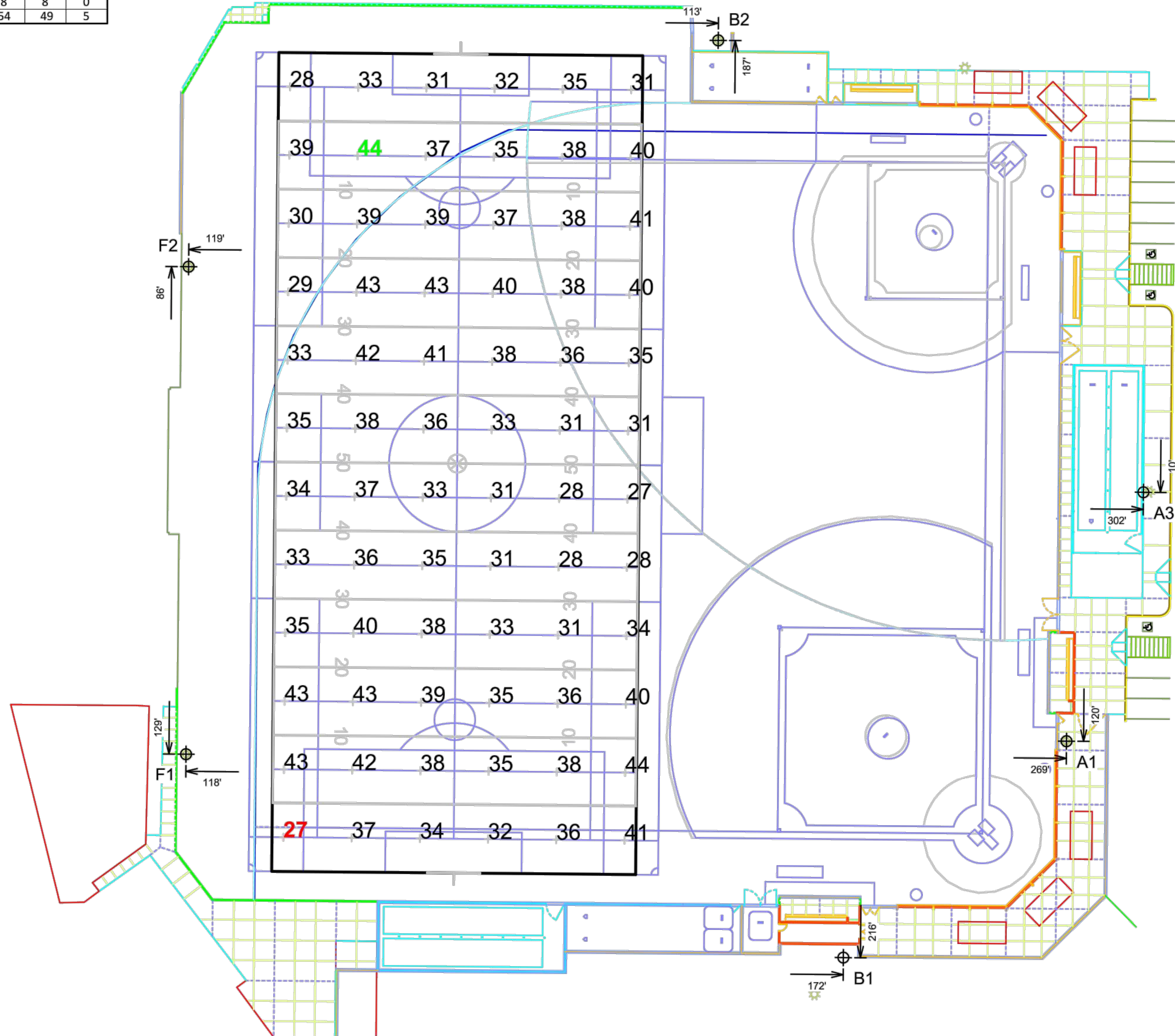
REFERENCE ONLY

Project No: 19-10-207  
Drawn by: ACB  
Date: 02-18-2020

E8.3



EQUIPMENT LIST FOR AREAS SHOWN								
Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
1	A1	70'	-	15.5'	TLC-BT-575	1	1	0
				70'	TLC-LED-1200	5	0	5
1	A3	90'	-	15.5'	TLC-BT-575	2	2	0
				90'	TLC-LED-1500	7	7	0
1	B1	90'	-	15.5'	TLC-BT-575	1	1	0
				90'	TLC-LED-1500	8	8	0
1	B2	90'	-	90'	TLC-LED-900	1	1	0
				15.5'	TLC-BT-575	2	2	0
				90'	TLC-LED-1500	7	7	0
1	F1	80'	-	80'	TLC-LED-600	1	1	0
				15.5'	TLC-BT-575	2	2	0
				80'	TLC-LED-1200	7	7	0
1	F2	80'	-	15.5'	TLC-BT-575	2	2	0
				80'	TLC-LED-1200	8	8	0
6	TOTALS					54	49	5



ENGINEERED DESIGN By: Zach Morris • File #203056D • 26-Feb-20

Pole location(s) ⦿ dimensions are relative to 0,0 reference point(s) ⊗

## Memorial Field Retrofit

Sandpoint, ID

GRID SUMMARY	
Name:	Football
Size:	360' x 160'
Spacing:	30.0' x 30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY	
MAINTAINED HORIZONTAL FOOTCANDLES	
Entire Grid	
Guaranteed Average:	30
Scan Average:	35.9
Maximum:	43.8
Minimum:	26.9
Avg / Min:	1.33
Guaranteed Max / Min:	2.5
Max / Min:	1.63
UG (adjacent pts):	1.58
CU:	0.38
No. of Points:	72
LUMINAIRE INFORMATION	
Color / CRI:	5700K - 75 CRI
Luminaire Output:	136,000 / 160,000 / 65,600 / 89,600 / 52,000 lumen
No. of Luminaires:	49
Total Load:	56.23 kW

Lumen Maintenance			
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1200	>81,000	>81,000	>81,000
TLC-LED-1500	>81,000	>81,000	>81,000
TLC-LED-600	>81,000	>81,000	>81,000
TLC-LED-900	>81,000	>81,000	>81,000
TLC-BT-575	>81,000	>81,000	>81,000

Reported per TM-21-11. See luminaire datasheet for details.

**Guaranteed Performance:** The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

**Field Measurements:** Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

**Electrical System Requirements:** Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

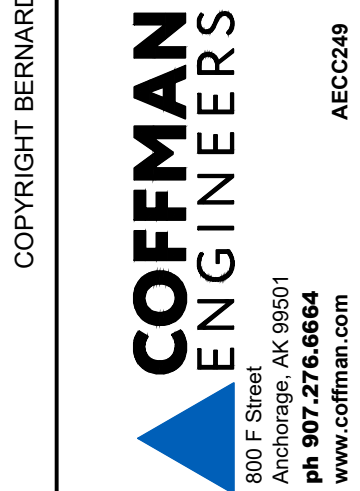
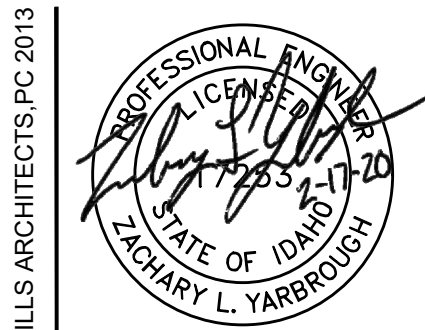
**Installation Requirements:** Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



We Make It Happen®

Not to be reproduced in whole or part without the written consent of Musco Sports Lighting, LLC. ©1981, 2020 Musco Sports Lighting, LLC.

## ILLUMINATION SUMMARY



COPYRIGHT BERNARDO WILLS ARCHITECTS PC 2013  
163 SOUTH JEFFERSON SPOKANE WASHINGTON 99201 509.838.4511 FAX 509.838.4605 WWW.BERNARDOWILLS.COM

B W A BERNARDO WILLS ARCHITECTS PC

Project No: 19-10-207  
Drawn by: ACB  
Date: 02-18-2020

E8.4

BID SET  
REFERENCE ONLY

War Memorial Field Enhancements  
Ontario Street  
Sandpoint, Idaho



